DOMESTIC ENGINEERING

Plumbing & Heating Contracting and Merchandising

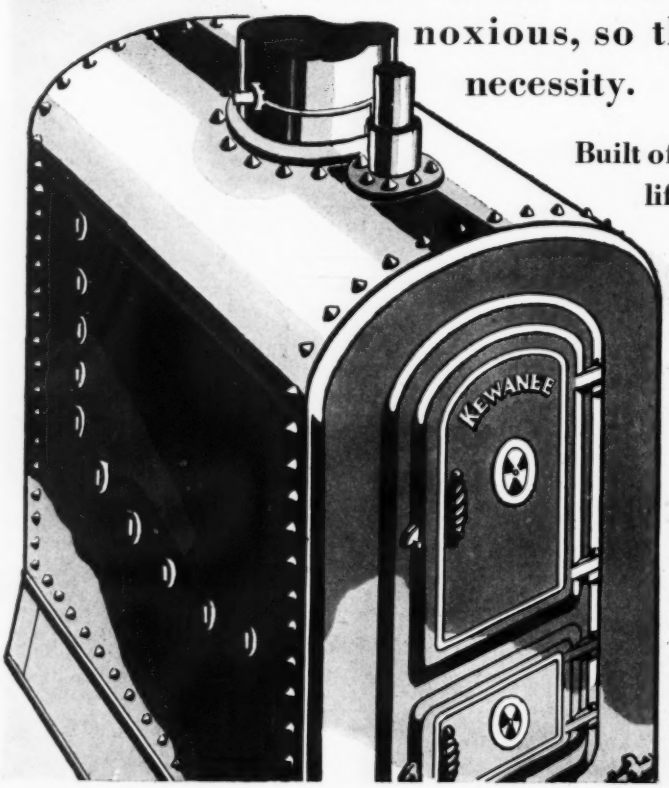
Determining Pipe Sizes for Hot Water Heating Systems

JULY 27, 1929

KEWANEE

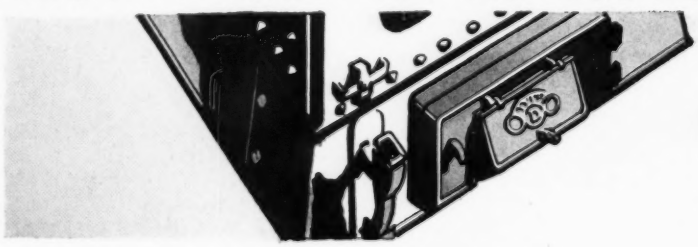
Water Heating GARBAGE BURNERS

Use garbage and rubbish as part of the fuel for heating water. So, they help reduce fuel bills. *And, they burn refuse* before it has a chance to become obnoxious, so they are a sanitary necessity.



Built of steel (riveted) they give a lifetime of "service"— fit companions for their bigger brothers, Kewanee Boilers.

Hot Water is as necessary as Heat



Details in Catalog No. 75

KEWANEE BOILER CORPORATION
Kewanee, Illinois
division of
American Radiator and Standard Sanitary Corporation
Branches in 40 Principal Cities

More VOGEL Number Tens to be Installed

BIDS ARE OPENED FOR NEW PAROCHIAL SCHOOL

Philadelphia Firm Will Build St. Elizabeth's For $239,885

Although no decision was reached as to the award, the bids for the new St. Elizabeth's Parochial School were opened yesterday in the offices of the Delaware School Foundation, which organization is aiding in the building of the school by preparing the plans. The low bid was submitted by the H. John Homan Company, of Philadelphia. It totaled $239,885. In view of the fact that the companies were invited to bid, it is thought most likely the H. John Homan Company will secure the contract. A further meeting of the committee will be held tomorrow morning.

Other bids were the North Eastern Construction Company, Baltimore, $248,680; W. R. Dougherty Company, Philadelphia, $252,940; Joyce and Kerrigan, Inc., Wilmington, $267,931; William M. Francis Company, Wilmington, $269,500; John E. Healy and Sons, $275,000 and Charles J. Dougherty, $280,000.

SCHOOL Boards and Plant Managers prefer the VOGEL SELFLUSH Number Ten because of the HEAVY, TWICE-FIRED VITREOUS CHINA BOWL and the SIMPLY OPERATED VALVE which has all moving parts of HIGH TENSION BRONZE, also the fact that this outfit CANNOT LEAK UNDER ANY CONDITIONS.

They also like the ABSENCE OF COMPLICATED PIPING and the quality of the HARDWOOD AIR-SEASONED SEAT.

All these parts are real features.

Then remember that the VOGEL SELFLUSH Number Ten can be supplied with open-front seat and with juvenile height bowl.

All of these features are being brought to the attention of your customers regularly through publications and direct-by-mail.

We also have folders, stickers, and other helps. Tell us what you need and we'll imprint your name and address.

See Inside Back Page for Coldie and Frostie—the VOGEL Cold-Test Twins

—Can be furnished with open front seat.

JOSEPH A. VOGEL COMPANY

WILMINGTON, DEL. :: ST. LOUIS, MO.

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Plumbing & Heating Contracting and Merchandising

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WOLVERINE

WB · EQUIPMENT TO OPEN CLOGGED DRAINS & SEWERS

Wolverine Drain Pipe Solvent

It was only after diligent analytical research that the Wolverine Brass Works added to its line the WOLVERINE DRAIN PIPE SOLVENT.

This Solvent is a compound of chemically pure ingredients in flake form to prevent crystallization. It easily dissolves in water, making a powerful concentrated solution that quickly removes drain pipe stoppage with no offensive fumes.

Master Plumbers find WOLVERINE DRAIN PIPE SOLVENT highly efficient in their own work and confidently recommend it to their customers for home use.

Put up in one and twenty-five pound containers.

Wolverine Sewer and Waste Pipe Rods

For easy handling and quick, effective opening of clogged waste pipes and sewers, the Master Plumber has in the Wolverine Equipment tools with no equal. The Rods are made of finely tempered steel, with Rotary Head that rolls freely over joints and irregularities. The Holder means ease and safety in handling.

WOLVERINE BRASS WORKS

GRAND RAPIDS WB MICHIGAN

We Sell the Retail Plumbing Trade Exclusively

In March, 1927, "Domestic Engineering" launched a regular and permanent plumbing and heating merchandising section.

Between Ourselves

"Today all industry is selling merchandise from the consumer's point of view."—Herbert W. Hess.

In thinking of heating, often we pay so much attention to assuring ourselves that we have estimated the proper amount of radiation, that all of the exposures are accounted for, and other such details, that we overlook the piping system, where the size of the piping may account for as much error as a difference in radiation. On account of the importance of this piping, we are publishing an article on the subject in this issue.

Your Editor

THE MOST perfect heating equipment may go wrong unless the pipe sizes are right. Just here is where the progressive and well informed heating contractor can assure himself of a constantly increasing business this year and those to come. Thousands of otherwise first-class jobs have ended in disaster and cost the contractor money, customers and reputation, simply because he failed in selecting the proper and adequate pipe sizes. For this reason, every heating contractor should read and thoroughly assimilate the careful and scientifically accurate presentation of the subject, "Determining Pipe Sizes for Hot Water Systems," by F. E. Giesecke and Elmer G. Smith. Their exhaustive discussion of every phase of these essential requirements for satisfactory hot-water heating, leaves little to be said further upon the subject.

DID you ever think of or use your truck as a "moving bill-board?" Of course, it all depends upon what sort and style of a "board" it is, but when an alert plumbing and heating contractor reports that he increased his repair work 100 per cent since adopting the plan, and tells why, you will want to know how he does it. You will find the story told in detail in this week's Merchandising Section. Another successful retail experience in the use of direct mail methods is also related.

NO MATTER what may be the size of your business today, you are expecting it to grow. A handicap that will prove dangerous is trying to get along with an out-of-date cash-book. That is why the latest discussion of "Modern Accounting—Simplified," in this issue, deserves the immediate attention of every contractor in the plumbing and heating field. In it, A. J. Peel explains the most efficient way to record payments and receipts. Clear-cut and usable forms that may be readily adapted to the business of any contractor are included. This series describes the most time-saving methods to introduce and maintain in the bookkeeping department of the plumbing and heating contractor's office, and are available for immediate use.

FROM Australia, J. H. Bain, of Sydney, sends this friendly message: "In renewing my subscription, I would like to state how pleased I am with the many instructive and excellent articles that have appeared in your paper from time to time during the last twelve months and I congratulate the master plumbers of America on having such a paper that assists our trade in so many ways as 'Domestic Engineering' does."

CREATIVE selling, as explained at the Buffalo convention by R. R. Cunningham, is by long odds a more profitable policy for manufacturer, wholesaler and retailer alike, than the old style, cut-throat competition. Manufacturers have reason to note and keenly appreciate the rapidly increasing number of plumbing and heating contractors who are aggressively developing such creative selling ideas as those described by Joseph Gessler, himself a master plumber, in an interview published in this issue's Merchandising Section. It means better business, and increasing profits in exact ratio, for all concerned.

WHATEVER we may think of law enforcement as applied to some laws and constitutional amendments, the practical value of strict and conscientious administration of all modern up-to-date plumbing statutes is one of vital importance, both to the community as well as to the every-day business affairs of the plumbing and heating contractor, wherever he is located. So "Why Enforce Plumbing Laws?" by R. M. Starbuck, Jr., in this issue, in answer to the frank inquiry of a Pontiac, Mich., master plumber, is a timely message.

JOHN HOWATT, chief engineer, Chicago Board of Education, in the next issue of DOMESTIC ENGINEERING presents an article on swimming pools that cannot fail to prove of great value and practical interest to the master plumbers in thousands of communities where such a public improvement may be successfully promoted.

The man who is so busy that he does not have time to read his trade paper is like the man who was so busy chopping wood that he did not have time to sharpen his axe

2 T/NS IN ANOTHER CLARENDON, VA., HOME

Owner, Brumbach Realty Co.
Architect, A. F. Thelander

Try the T/N on your next lavatory or small bathroom job

FITS IN A CORNER OR UNDER A WINDOW

Here's a water closet that is a wonderful space-saver in the small bath or washroom. The T/N can be installed in a corner or even under a window—there's no wall-tank to interfere. Try it on your next job.

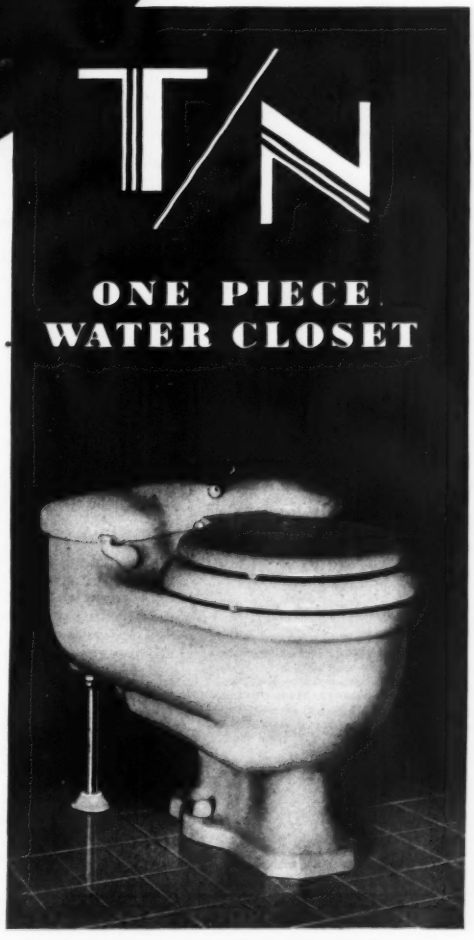
Customers like the T/N because it is so *quiet*—you can scarcely hear it outside the bathroom. It has a strong, "whirlpool" flushing action, too—and is non-overflowing.

Plumbers like the T/N because it comes packed in *one* crate, including seat ... has only two connections to make ... carries a good profit.

We invite you to write now for the name of your nearest jobber.

ONE PIECE WATER CLOSET SILENT NON-OVERFLOW
Patented. Pat. Pend.

W. A. CASE & SON MFG. CO.
Established 1853
Dept. 507-A, 220 Delaware Ave.
Buffalo, N. Y.



Below is reproduced one of a series of color advertisements appearing regularly in The Saturday Evening Post and Good Housekeeping. This particular advertisement may be found in the July 20th issue of The Saturday Evening Post and the October issue of Good Housekeeping.

and easy for plumbers to sell

No one knows better than the progressive plumber that there is an increasing number of people who want "the best" in any equipment they buy. These families are now inquiring about Monel Metal sinks.

They have been quick to recognize the advantages of a sink fabricated of this silvery Nickel alloy. They appreciate the convenience of inbuilt drawers and slides—impossible in the ordinary sink.

But these same intelligent and discriminating people are also conscious of the inherent advantages of Monel Metal. They understand (many *know* from experience) that it will not rust, that it resists corrosion, that it has no coating to chip, crack or wear off. They realize that Monel Metal harmonizes with modern color schemes—that it makes possible the manufacture of special jobs to meet special requirements.

These and many other points suggest the profit you will find in Monel Metal sinks. Ask us to send you information about sources of supply and other details. Write today!

Monel Metal is a technically controlled Nickel-Copper alloy of high Nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company, Inc. The name "Monel Metal" is a registered trade mark.

INCO MONEL METAL

MONEL METAL

SEND FOR SPECIAL MONEL METAL SINK LITERATURE

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

Million Dollar Words

about 1,000,000 Toilet Seats

WHALE-BONE-ITE

LAMINATED

"Whale-bone-ite" has made possible a toilet seat strong enough to defy the slam-bang abuse of the public—to be guaranteed for the life of the building—to end immediately all replacement expense.

And without "Laminated" there would be no "Whale-bone-ite". "Laminated" wood is Nature improved by Science. Science secures immense strength with remarkable lightness.

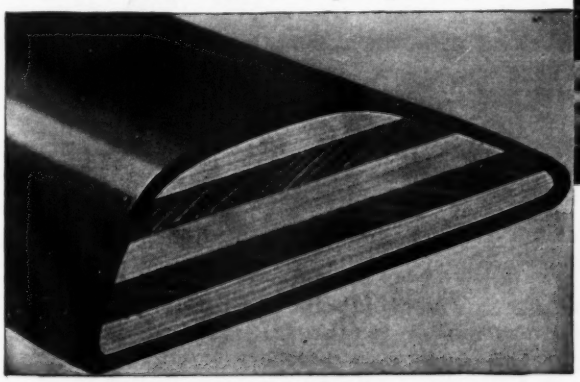
We and others have found it impossible to make a seat by any other method anywhere near as sanitary, as strong and as light. Fourteen years of service have proved its value. More than a million are in use. Those concerned with the design, construction and operation of buildings have found this experience safe to follow, so that today nearly all seats going into public toilets are of laminated construction.

The handsome polished Whale-bone-ite surface will last a life-time. It is easy to clean and non-inflammable.

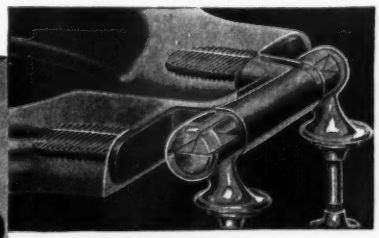
Whale-bone-ite Seats are found quite generally in the guest bathrooms of fine hotels as well as in public institutions where service requirements are severe. Many new apartment houses are equipping all toilets with them.

Send for free cross-section
— see its strength yourself

Figures show that on the average ordinary seats have to be replaced about every three years. If you want to end this needless expense, just as it already has been ended in more than a million public toilets in modern and remodelled buildings, simply install Whale-bone-ite Seats as fast as other seats wear out. Not only will the replacement expense end, but the toilets will be cleaner as Whale-bone-ite is easier to keep clean. Without obligation send for a free Whale-bone-ite cross-section. Simply address Dept. **F-14,** Seat Division, The Brunswick Balke-Collender Co., 623 South Wabash Ave., Chicago.



Note the Laminated Construction — a core of alternating-grain layers of hardwood — sealed and bonded to the whole by Whale-bone-ite. It is warp-proof and is guaranteed against warping, cracking and splitting.



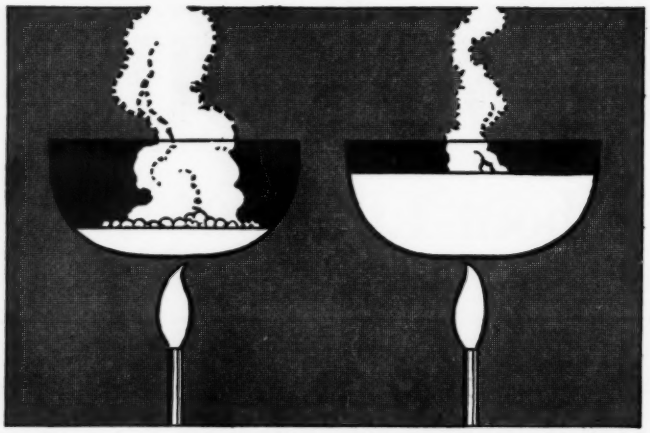
The Whale-bone-ite steel hinge is moulded integral with the Seat forming an unbreakable unit. Covered with Whale-bone-ite, the hinge is as handsome as the Seat. It cannot tarnish. It is easy to clean.

BRUNSWICK
WHALE-BONE-ITE
TOILET SEATS

THE BRUNSWICK-BALKE-COLLENDER CO. , Chicago

Atlanta	Chicago	Detroit	Minneapolis	Philadelphia	St. Louis
Birmingham	Cincinnati	Harrisburg	Nashville	Pittsburgh	Tampa
Boston	Cleveland	Houston	Newark	Richmond	Washington
Buffalo	Dallas	Kansas City	New Haven	San Antonio	Montreal
Charlotte	Denver	Los Angeles	New Orleans	San Francisco	Ottawa
Chattanooga	Des Moines	Memphis	New York	Seattle	Toronto
Sidney, Australia			Havana		Buenos Aires

Which Will Boil First?



Correct water content, whether in a kitchen vessel or a heating boiler, means quick steaming and economical firing. Pacific boilers, with their correctly proportioned water content, are 20% to 30% quicker on the "getaway" in the morning than other firebox boilers. They save fuel at the time of forced firing when other boilers are wasting it.

At night, when fires are banked, the Pacific's water content is sufficient to continue to supply heat to the radiators for as long a time as a boiler with 50% greater water content. On the other hand, in the morning no fuel is wasted in heating an over-sized water content—heat that is unnecessary.

Owner, tenant, and fireman profit when a Pacific is installed. The owner saves fuel, the tenant is assured of the utmost comfort, the fireman has less firing to do and starts it at a later hour in the morning.

This properly proportioned water content, the high percentage of direct heating surface, and the Pacific's exclusive system of forced circulation give an economy and a flexibility obtainable in no other boiler.

Write for literature on the several types of Pacific installations. There is one to fit your next job.

PACIFIC

STEEL HEATING BOILERS

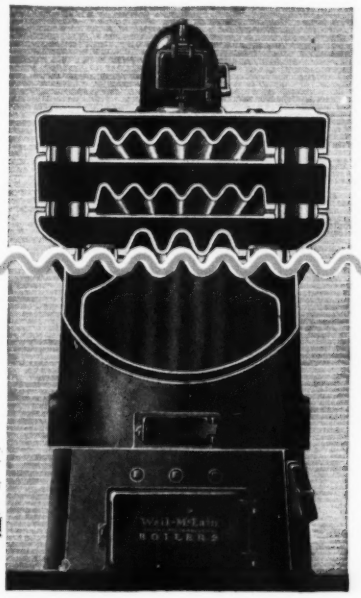
AND CAPITOL RADIATORS MAKE A LOGICAL COMBINATION

PACIFIC STEEL BOILER CORPORATION

Factories: Waukegan, Ill., Bristol, Pa.

Sales Offices in 58 Cities

Division of United States Radiator Corporation, Detroit



These corrugations

add 30% to 40% more heating surface

They mean fewer tons of coal or coke . . . fewer gallons of oil consumed

Doubtless you have often seen, in Weil-McLain Boiler advertising, a wavy line like this~~~~~~.

But have you thought how such a wavy line, as compared with a straight line like this_____, crowds perhaps one-third more lineal surface into a given space?

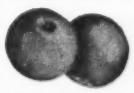
This wavy line illustrates very clearly the corrugation principle, as applied in the Weil-McLain Round Boiler. In much the same way, the vital heat-absorbing surfaces in this famous boiler are corrugated like this~~~~~~, instead of flat like this_____.

Thus, in Weil-McLain Round Boilers, more heat-absorbing surface is crowded into a boiler of the same size. And as a final result, fewer tons of coal or coke, or fewer gallons of oil are required to heat a home.

But you will find other reasons why this famous boiler gives more heat and saves fuel. For example, in its long, balanced back-and-forth fire travel, the hot gases are baffled backward and forward through the corrugated heat-absorbing surfaces. There are no short cuts to the chimney, under *any* conditions. A final safeguard against chimney waste!

There are Weil-McLain Boilers to meet all conditions . . . Round Type, Jacketed, Self-feed, Square, and Smokeless. Also Weil-McLain Radiators.

They look alike, but *are* they?



Be wise . . . analyze!

The Weil-McLain Line of Boilers has many sales features that remain hidden under casual or indifferent examination. Analyze these features. They will surely help you close jobs—at a profit.

WEIL-McLAIN COMPANY

General Offices: Chicago, Illinois
Boiler Factory: Michigan City, Indiana
Radiator Factory: Erie, Pa.

Weil-McLain
SCIENTIFIC COMBUSTION
BOILERS

© 1929, W.-McL.

don't sell cast iron

sell Made-to-Measure Warmth

Playroom

Bed Rooms

Grandma's Room

Bath Room

Living Room

WHEN THE PROSPECT IS ALMOST PERSUADED - *the Bond may close him*

The National *Made-to-Measure-Warmth* idea lets you talk results instead of causes—lets you talk warmth instead of cast iron. This newest idea in modern heating paves the way to the name on the dotted line. And the most convincing way to close your prospect is to offer him the *guaranteed* guarantee—the National Boiler Bond.

Each National Boiler is guaranteed by a National Boiler Bond issued by The Fidelity and Casualty Company of New York, one of the largest financial institutions of its kind in the world. The National Boiler Bond not only guarantees against defects in design, manufacture and materials—but, most important of all, guarantees boiler *performance*. When shown a National Boiler Bond, your customer has every reason to sign the contract with you, for the bond carries conviction of absolute satisfaction and the assurance that you will install material of highest quality and proved dependability.

The National Boiler Line offers you outstanding units in all types and sizes. Each National Product is a leader in its field and has an unimpeachable record of proved performance in all types of structures. Each gives the quality of certain and sustained service that your customers are seeking today. Write for a National Bonded Direct Cast Iron Radiation Loads booklet that shows the number of square feet of cast iron radiation each National Boiler is bonded to heat.

NATIONAL RADIATOR CORPORATION

***Executive Offices:* 55 West 42nd Street, New York, N. Y.**

NATIONAL

Made-to-Measure HEATING SYSTEMS

Copyright 1929
National Radiator
Corporation

THE CELEBRATED SKIP TOOTH DIE
(Genuine Nye)
REG. U. S. PAT. OFFICE

NYE
Pipe Threading
OIL

It is only after years of experiment under conditions actually encountered in our own factory, we are offering Nye Pipe Threading Oil. This oil, specially compounded, is an excellent coolant, a good penetrant, and has the necessary "body" to form an efficient cushion for the die when in operation.

These qualities are very essential if clean, sharp and accurate threads are to be had. Many oils work fairly well on power threading where the die is flooded by a pump, but do not take care of hand threading because they do not cling all the way around the thread. We can positively say this trouble will never be experienced with our oil.

Nye Pipe Threading Oil may be ordered in cans from 1 to 15 gallons and in 30 or 50-gallon drums.

NYE OIL KIT

16-gallon standard Unit with lockable fill opening and steel gauge stick.

Let us solve your threading problems.

Write for Information

A Letter from Harry G. Nye

July 27, 1929.

To the Plumbers and Steamfitters of the U. S. A.

What has become of the old-fashioned preacher who used to preach these curse-of-gold sermons when we were boys? He made the village banker look like a bum, and the village bum like a banker. Making money was the work of the devil, and maybe the parson was right, because you certainly had to work like the devil to make it.

Well, I don't know what has become of the old-fashioned preacher, but I know where the new-fashioned preacher is. He's out at the country club playing pasture pool with his broker, or he's attending the weekly meeting of the Eatfast Club, and joining the gang in caroling the fact that Old Macdonald had a farm, e-i, e-i, o.

For the world has about decided that making money is not such a terrible crime, if a man makes it honestly, which is the easiest way to make it there is. The world thinks more of a sinner who pays his debts than of some psalm-singer who is behind with his rent. Money may be a sin, but standing off the plumber is no virtue.

I know a lot of men who have made money, bankers, and movie actors, and prize-fighters, and a few men who have made a lot of money, most of them waiters, and I never knew a man yet who was making it for himself. He was working like the dickens so his kids would never have to work at all. A fool idea, but give him credit for it.

Most men want to live, that, when their summons comes to join the innumerable caravan, the check from the trust company will keep right on coming every month just the same. If you don't think there is a lot of unselfishness in the world, consider the amount of life insurance that is carried.

And if I should ever even remotely suggest that an order for pipe-tools would help right now, I hope you will not think I mean help me. I'm thinking about the factory payroll and the family bankroll. And then think how it will help you—Nye Tools work so much faster and easier and make so much money for the man who buys them.

Not hinting or anything,

Harry G Nye

Copyright 1929 by Harry G. Nye.
All Rights Reserved.

OTHERWISE KNOWN AS
THE NYE TOOL & MACHINE WORKS
MANUFACTURERS OF HIGH GRADE PIPE TOOLS
4120-30 Fullerton Avenue Chicago, Illinois

THE CELEBRATED SKIP TOOTH DIE
(Genuine Nye)
REG. U. S. PAT. OFFICE

ANNOUNCING

STOCKHAM SPRINKLER FITTINGS

APPROVED

for Fire Protection Service

Stockham Sprinkler Fittings are made in accordance with requirements of the National Fire Protection Association and are known as American Standard Sprinkler Fittings, being made to specifications of the American Standards Association. They also have the approval of the Associated Factory Mutual Fire Insurance Companies and of the Underwriters' Laboratories.

Stockham Sprinkler Fittings are made in Standard Weight for water working pressures up to 150 pounds and in Extra Heavy for water working pressures up to 250 pounds. Like all other Stockham Fittings, they have accurate threads and flanges and easily make up straight pipe lines.

Leading supply houses in all important cities can quickly supply this complete line of approved fittings. A complete catalog will be sent upon request.

STOCKHAM PIPE & FITTINGS CO., *Birmingham, Ala.*
Stocks in Boston, New York, Chicago, Houston, Tulsa, Los Angeles

Be sure the name STOCKHAM *is on the Fittings you buy*

STOCKHAM FITTINGS

CAST IRON	ELECTRIC CAST STEEL	MALLEABLE
Screwed—Flanged—Drainage	*Screwed—Flanged*	*Standard—Extra Heavy—Oil Country Malleable*

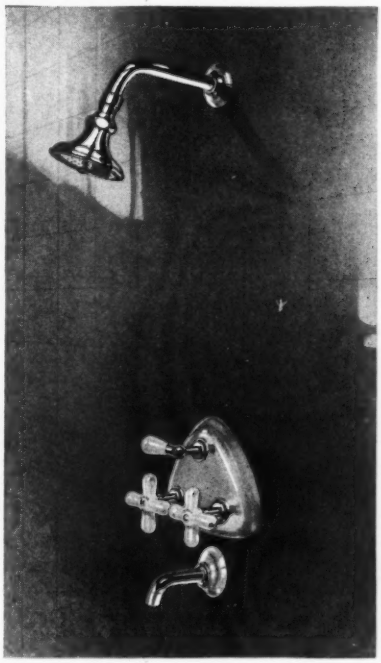
150 Pounds Pressure CRANE VALVES 2500 Pounds Pressure

There's more profit for you in Crane "Jr." fittings

A greater sales range and a wider profit margin await the contractor who pushes Crane "Jr." fittings.

They were developed by Crane engineers to furnish a product that would, through its low price, satisfy the demands created by the activity in building low rental properties.

And they do satisfy it! Not in price alone, but in quality. For each unit in this new line is in every respect worthy to carry the name Crane Co. Each is of the same tested brass that has made regular Crane fittings famous. In all, standard composition discs and renewable seats are used; their construction is sturdy and each bears the usual Crane assurance of satisfactory service.



C 3846-B, Crane "Jr." shower and bath supply fixture. Its compactness, efficiency, and low cost make this the ideal fitting for a small apartment or cottage bathroom.

CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVENUE, CHICAGO

NEW YORK OFFICE: 23 W. 44TH STREET

Branches and Sales Offices in One Hundred and Eighty Cities

Right: Fig. 370 Jenkins Standard Bronze Globe Valve.
Above: Installing Fig. 370 Valves in new piping.

Easily installed — saves time

Contractors' men like to handle Jenkins. They like the "heft" of these sturdy valves with bodies that aren't sprung under rough treatment. They like the heavy clean cut threads that reduce the possibilities of stripping, and which simplify the work of installation. And they know that when Jenkins go in, they go to stay.

Your supply man can furnish Jenkins Valves of bronze and iron, in standard, medium and extra heavy patterns.

JENKINS BROS.

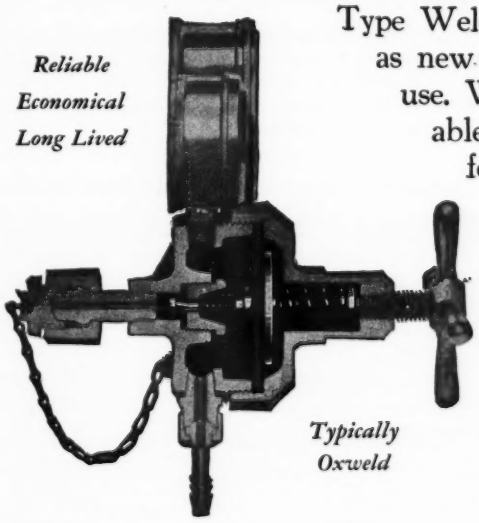
80 White Street, New York, N.Y. — 133 No. Seventh Street, Philadelphia, Pa.
524 Atlantic Avenue, Boston, Mass. — 646 Washington Boulevard, Chicago, Ill.
JENKINS BROS., Limited, Montreal, Canada; London, England
Factories: Bridgeport, Conn.; Elizabeth, N. J.; Montreal, Canada

Jenkins
VALVES
Since 1864

Will $3.60 buy a new Oxygen Regulator?

No! *But* $3.60 will make an Oxweld Stem Type Welding and Cutting Regulator as good as new—even after it has had years of hard use. Why? Because simplicity of design enables you to buy the whole "inside works" for $3.60!

Reliable
Economical
Long Lived



Typically Oxweld

Oxweld Regulators are built to last. Rugged—no delicate mechanism—plenty of the right material in the right place. Design permits gas flow in any desired quantity. Uniformly dependable for accurate and steady reduction of pressure from cylinder to blowpipe on every type of oxy-acetylene welding and cutting work.

OXWELD

WELDING AND CUTTING APPARATUS AND SUPPLIES

OXWELD ACETYLENE COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

NEW YORK
Carbide and Carbon Bldg.

CHICAGO
Carbide and Carbon Bldg.

SAN FRANCISCO: Adam Grant Building

MODERNIZE WITH CONVERSIONS

Almost overnight the GAS CONVERSION SITUATION *has assumed New Significance*

NOW SELL

Automatic Tailor Made

GAS CONVERSION HEATING SYSTEMS

NOT so many years ago, GAS heat was looked upon as a "high-priced luxury." But—a few years previous to that—so was a bathroom and *any* heating system.

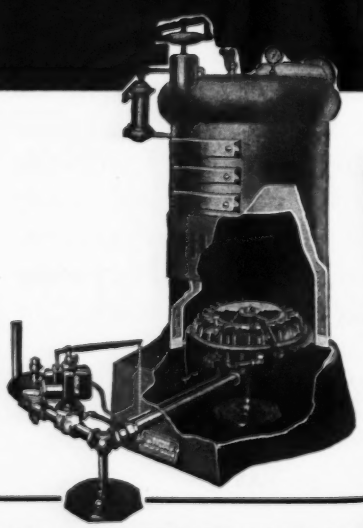
The bathroom and the old style heating system had to pass through that stage of public test which has now established them as necessities. So, during the past few years, GAS heat has been undergoing the same test.

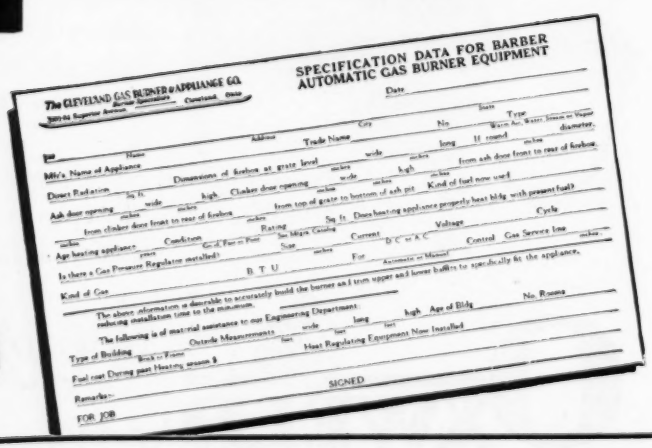
Through the efforts of the makers of Barber *Automatic* Jet Gas Burners, Gas heat has been reduced to a simple science, that is now within the reach of every home in the land.

The makers of Barber *Automatic* Jet Gas Burners have likewise removed all of the old sales obstacles to Gas heat and have substituted a plan that is just as simple, just as effective and just as sure as the operation of Barber Burners themselves.

The Barber Specification Data Sheet and the New Barber catalog are all you need to have to make some handsome profits on Barber "Tailor-Made" *Automatic* Gas Conversion sales. Let us tell you how the gas conversion market has been made ready for you to reap big profits in. Write today!

The CLEVELAND GAS BURNER & APPLIANCE CO.
Burner Specialists
3102-04 Superior Avenue, Cleveland, Ohio




The CLEVELAND GAS BURNER & APPLIANCE CO.
3102-04 Superior Avenue, Cleveland, Ohio

SPECIFICATION DATA FOR BARBER AUTOMATIC GAS BURNER EQUIPMENT

Date

For Name Address City No. State

Mfr's Name of Appliance Trade Name Type

Direct Radiation Sq. ft. Dimensions of firebox at grate level inches wide inches high Warm Air, Water, Steam or Vapor

Ash door opening inches wide inches high Clinker door opening inches wide inches high long ft. round inches diameter

from clinker door front to rear of firebox inches from top of grate to bottom of ash pot Kind of fuel now used

Age heating appliance years Condition Grate Fire or Pot Rating Sq. ft. Does heating appliance properly heat bldg. with present fuel?

Is there a Gas Pressure Regulator installed? Size Sq. ft. Steam Cooling Current D. C. or A. C. Voltage Cycle

Kind of Gas B. T. U. inches For Ammonia or Methyl Control Gas Service line inches

The above information is desirable to accurately build the burner as from vapor and lower boilers to specifically fit the appliance, reducing installation time to the minimum.

The following is of material assistance to our Engineering Department:

Type of Building Brick—Frame Outside Measurements feet wide feet long high Age of Bldg. No. Rooms

Fuel used During past Heating season $ Heat Regulating Equipment Now Installed

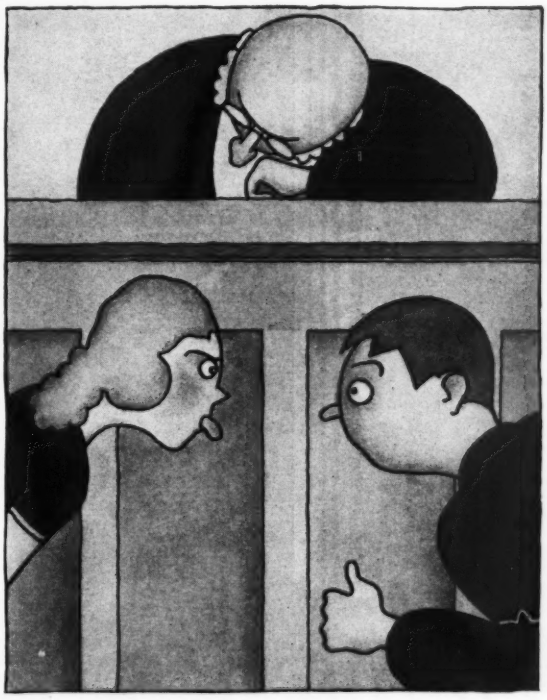
Remarks:

SIGNED

FOR JOB

BARBER *Automatic* JET GAS BURNERS

famous dumb guys of history



Another happy little home gone. Another loving couple rent asunder. Another left hook to the wishbone of chubby little Cupid, who can only moan pitifully and lick his wounds. Another sad case in the Divorce Court.

A year ago Amelia and Georgie were dear to each other's hearts. The break came when they planned the new bathroom. Amelia, knowing her vegetables, wanted an Improved Madera Toilet.* Georgie, still smarting from the bill for her last hat, uttered a vile oath and put in a cheap closet.

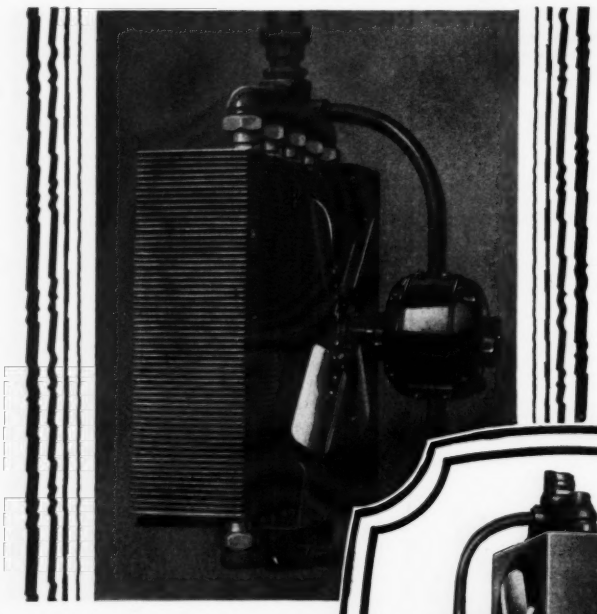
And what a time they have had since! The closet howled as a dumb beast in pain. It spouted. It overflowed every so often onto the cubist furniture downstairs. . . .

If the Judge is wise (he heard this from his wife) he will tell them to go home, put in an Improved Madera* and let Peace fold its wings over the troubled waters.

***The Improved Madera has a large, oversize trapway which safely passes sanitary pads.**

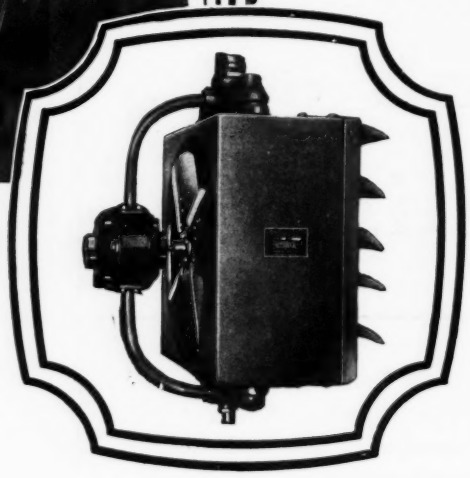
In addition to the Improved Madera at $85, America's finest, most modern toilet, Maddock also offers the Madbrook at $50 and the Maderno at $31. The Madera and Madbrook have split-proof white seats All have Durock bodies, and large bowls and seats. All are unusual values for the money, and the plumber who carries the Madera at $85, as well as the Madbrook and Maderno, is able to compete for all the business in his community with modern elongated closets.

THOMAS MADDOCK'S SONS CO.
Trenton, New Jersey



Bigger than its job

To make sure that every Thermal Unit will prove bigger than its job, the heating section of each heater undergoes a test of 400 pounds.



Efficiency that doesn't wane

In laboratory tests, the Thermal Unit is not surpassed by any other Unit Heater—but never lose sight of the fact that a laboratory test deals only in maximum efficiency made under *ideal* conditions.

It is in the greater and more exacting laboratory of daily use that the added stamina of the Thermal Unit *counts*. Instead of the efficiency curve drooping and doing a slow "fade out," it stays on the high flat plane.

Behind this sustained efficiency is the durable one-piece heating element—the basic betterment of the Thermal Unit. Cast in a specially formulated aluminum alloy, this sturdy unit will withstand higher pressures than any piping system. There are no joints, welds or soldered connections—no points at which leaks can develop. Even freezing in service cannot damage it.

In this way, the weak point of ordinary construction has been made the strong point of the Thermal Unit. Let us show you what this balanced design means from a practical standpoint. Write.

THERMAL UNITS CO.
A Subsidiary of the Mechanical Mfg. Co.
Pershing Road and Loomis St., Chicago
Eastern Office: 30 Church St., New York, N. Y.

Approved by the Investigating Committees of Architects and Engineers

THERMAL UNIT
INTEGRAL SECTION
HEATERS
PATENT PENDING

It outlasts them all

What Would Washington Say?

AN almost commonplace speculation, yes! In the 153 years of American Independence, celebrated this month, such a question has occurred countless times. But, in fact, just what *would* Washington say?

Suppose he should behold our disks that sing, our radio that whirls the human voice around the earth, our aircraft that have conquered the skies and our talking moving pictures—to say nothing of our automobiles, rushing railway trains, vast industrial plants, towering buildings, giant steamships, our telegraph, telephone and electric lights, and electric refrigeration?

Here is the answer—He would say, "MARVELOUS"—and in two days he would cease to marvel. It would then be an "old story" to him, *just as it is to all of us, now wondering what science will next bring forth.*

ALSO AN "OLD STORY"

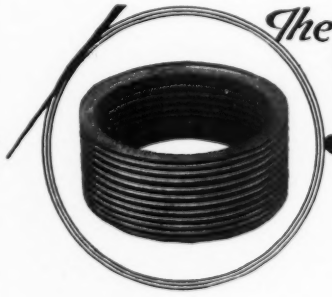
Like the more spectacular discoveries of science the *Sylphon Bellows* is also an "old story." For twenty years its contribution to industrial progress and human comfort while, not so dramatic has been none the less, *basic and essential.* It is the World's most durable, flexible and sensitive expansion member and is employed as the motor element of hundreds of thousands of thermostats in the most highly recognized radiator traps, refrigerating machines, automobiles, industrial and building temperature regulators.

As a damper regulator it is factory equipment on the principal heating boilers; as a sealing diaphragm in packless valves in thousands of representative buildings; as a diaphragm in packless fuel pumps; in pressure governors and many other important diaphragm applications. During the war it operated the firing mechanism of deep-sea mines, the governing mechanism of torpedoes and was invaluable to the airplane.

It is constantly finding new fields of usefulness.

The original and genuine Sylphon Bellows is used only in Temperature and Pressure Regulators manufactured by the Fulton Sylphon Company. Our plant is the largest in the world devoted exclusively to the manufacture of thermostatic instruments.

We invite those interested to write for fully descriptive bulletins and to submit (without obligation) problems involving Sylphon Temperature or Pressure Regulation. Address Department D.



The Sylphon TRADE MARK BELLOWS

ORIGINATED AND PATENTED BY

FULTON SYLPHON CO.

KNOXVILLE, TENN., U.S.A.

Representatives in all Principal Cities in U. S. A.—European Representatives, Crosby Valve & Eng. Company, Ltd., 41-2 Foley St., London, W. 1., England—Canadian Representatives, Darling Bros., Ltd., 140 Prince St., Montreal, Que., Canada

Get your prospects looking at

The SMITH "16"

from the inside

To your average prospect, all boilers look somewhat alike. Unless you introduce him to the "inside works," he is as apt to buy on price as anything else. What does he know about boiler efficiency? Does he know that efficiency is the only thing that can give him heating comfort at low cost? In a general way, perhaps, but it doesn't mean much to him until you really explain it. And then it means so much, he buys a Smith "16."

EXTRA LARGE FIRE SURFACE

When fuel has been properly burned (and it will be because of Extra Large Fuel Space, Extra Large Combustion Space, because the Fire Pot is lined with Fire Brick and because of the Auxiliary Air Supply), and every bit of heat it contains liberated, the Smith "16" has done the first half of its job efficiently.

The second half remains to be done—absorbing the heat into the system so it can be delivered to the rooms of the house where it is wanted.

The Smith "16" does this efficiently, too, because it has plenty of Fire Surface—enough to absorb more heat than the house will ever require—more fire surface than has ever before been supplied in a boiler of equal grate area.

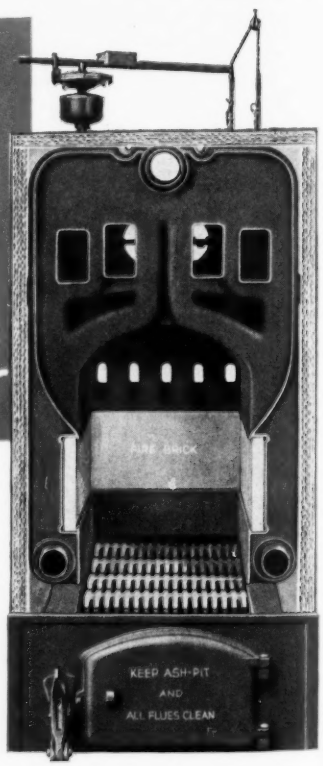
By explaining this and other efficiency features, you help your prospect to look inside the Smith "16" and to appreciate that boilers, too, can be different, even if they do look somewhat alike on the outside.

For complete information to help make your sales easier, write for free booklet, "The Smith 16". Address, The H. B. Smith Company, Dept. A-63, Westfield, Mass.

SMITH "16" Sales Features

The New Smith "16" has everything that makes for easy selling and satisfied customers.

- Extra Large Fuel Space
- Extra Large Combustion Space
- Fire Pot Lined with Fire Brick
- Insulated with Air-cell Jacket
- Auxiliary Air Supply
- Extra Large Fire Surface
- Especially Adapted for Gas and Oil



THE H·B·SMITH
BOILERS & RADIATORS
Used in fine homes and buildings since 1860

The H. B. Smith Boilers for steam, hot water and vapor heating; radiators; and hot water supply boilers; for every type and size of private homes, office building, factory and public building.

SALES OFFICES AND WAREHOUSES

NEW YORK	BOSTON	PHILADELPHIA	CLEVELAND	WESTFIELD,
10 E. 41st St.	640 Main St., Cambridge	49th St. and Grays Ave.	1108 Webster Ave. S.E.	MASS.

United States
Sink and Laundry Tray Combinations

THE Modern Kitchen Sink and Laundry Tray is a real combination for the kitchen in the home or apartment. A sink with drainboard is one unit being used at least three times a day and the other unit—a laundry tray saves many tiresome trips to the laundry.

The drainboard is reversible on this combination or can be removed from the fixture.

TWO SIZES

23x42 23x51

USANAR Acid-Resisting Enamel can be furnished.

Besides our regular white, Enameled Ware can be furnished in twelve colors.

United States Sanitary Mfg. Co.

PITTSBURGH, PA.

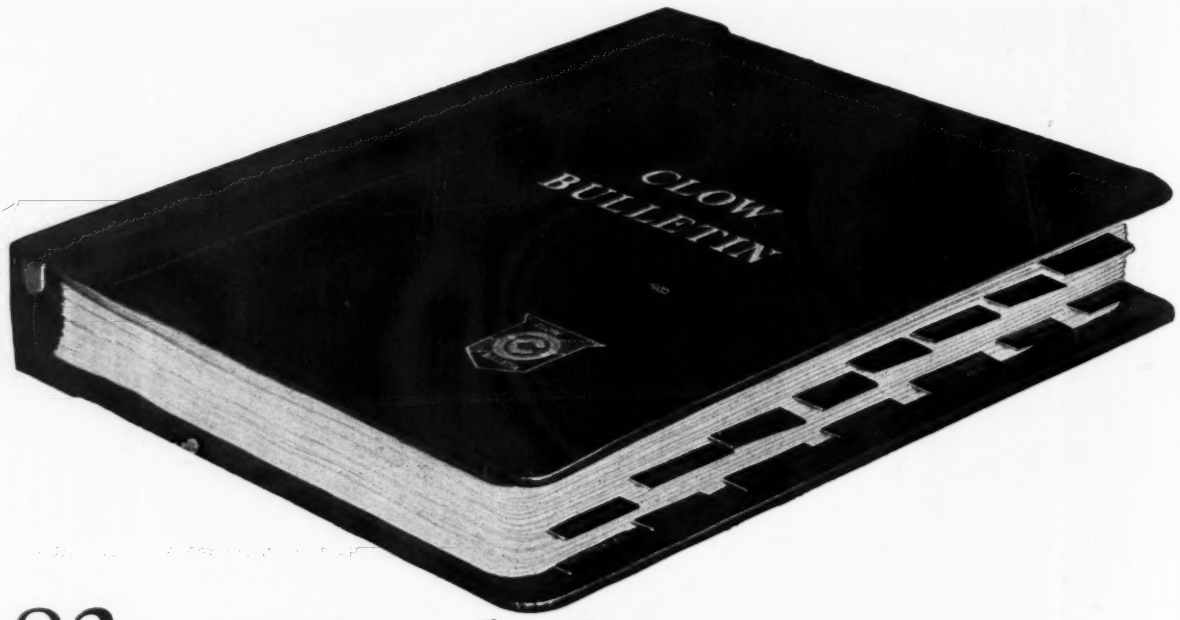
NEW YORK
CHICAGO
BOSTON

UNITED STATES SANITARY MFG. CO.

PHILADELPHIA
KANSAS CITY, MO.

One Product Only **ENAMELED WARE** *One Product Only*

PITTSBURGH PA.



83c *a Month Brings You . . .*

FREEDOM FROM COSTLY PRICING ERRORS . . . DISCOUNT ERRORS, MATERIAL MISTAKES, ETC.

The Clow Bulletin is the easy, fast, and *sure* estimator for all plumbing and heating jobs. No more time need be lost through writing away for current prices. No more money need be lost through faulty estimating. No more exasperating discounts from a dozen or more supply houses need be figured.

In fact, the Clow Bulletin can save its cost on the pricing of your inventory alone. It contains 450 pages. It is fully and perfectly illustrated, showing all modern appliances commonly used by the plumbing trade.

5,000 master plumbers are saving time, money and trouble with the Clow Bulletin. If you are not one of them, mail the contract below today. Remember—only 83 cents per month—to save many hundreds of dollars.

Clow Bulletin SUBSCRIPTION

REG. U.S. PAT. OFF. CLOW CHICAGO

Mail to
JAMES B. CLOW & SONS
201-299 N. Talman Avenue, Chicago, Ill.

We hereby subscribe for the Clow Bulletin at the rate of 83 cents per month ($10.00 per year).

Upon receipt of the Binder and Bulletin pages we agree to pay, at the monthly rate, the proper amount to carry our subscription until September 1st, and we further agree to pay thereafter the subscription price of this Service ($10.00) annually in advance.

And we further agree that the title of ownership to the Binder and Bulletin pages shall rest with James B. Clow and Sons and that upon our failure to renew our subscription at the end of any fiscal year (September 1st), or upon repayment to us by said James B. Clow and Sons at any time of the unearned portion of our subscription, we will surrender to said James B. Clow and Sons, or its authorized agent, the aforesaid Binder and Bulletin pages and this subscription shall be immediately terminated.

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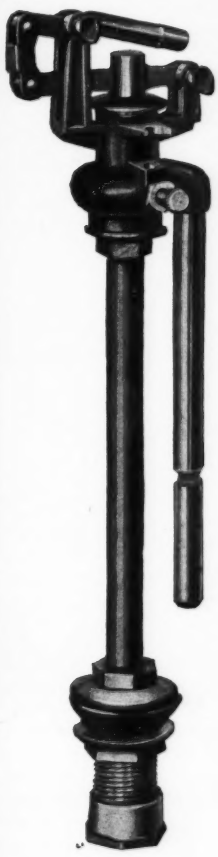
SILENT



No. 75 Silent Ballcock

INBRACO

The Indiana Brass Company

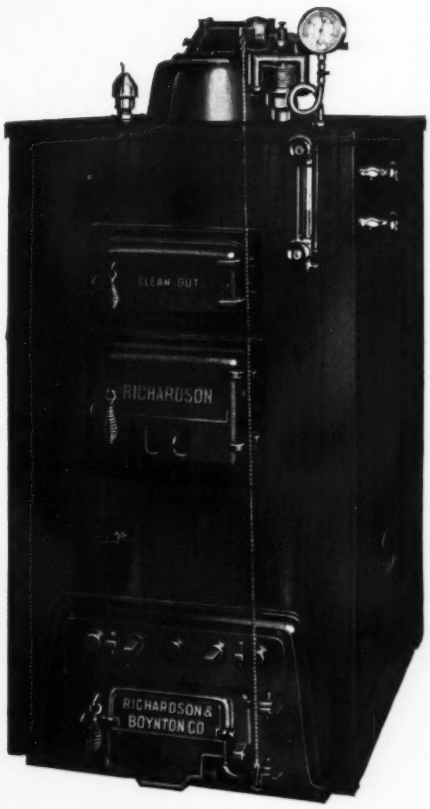
Frankfort, Indiana

LEAD ' ' The dependable metal

Modern life calls for convenience. It also calls for a show of beauty. But what are these values worth if beneath them there is not a solid foundation of endurance, of *dependability*? Lead has stood the test of dependability for many centuries. It stands today as the plumber's great ally in giving long lasting satisfaction and service. For lead is tough, elastic, withstanding shocks and disturbances that break other metals. *The Eagle-Picher Lead Company, 134 North La Salle Street, Chicago.*

EAGLE ' ' ' Pipe ' Fittings ' Solder

MODERN... but an Old Friend of Veteran Installers



RICHARDSON
Square Cased Boiler

NEW as the next minute, smart as Fifth Avenue,—here's a boiler that's modern in every line. No getting away from it—it's the modern note that sells to-day. But it's what's *inside* that makes the sale keep! And inside this bright blue casing is a boiler you know is right—your time-tried friend, the famous Richardson & Boynton Round Boiler. All the superiorities of round construction, proven by years of trouble-free service—plus the extra heat-saving insulation of the blue casing. All the selling points of yesterday with the sales appeal of to-day.

260 Fifth Avenue, New York City **Utica, New York**

New York Utica Newark Philadelphia Boston Chicago
Buffalo Minneapolis Cincinnati Providence Detroit

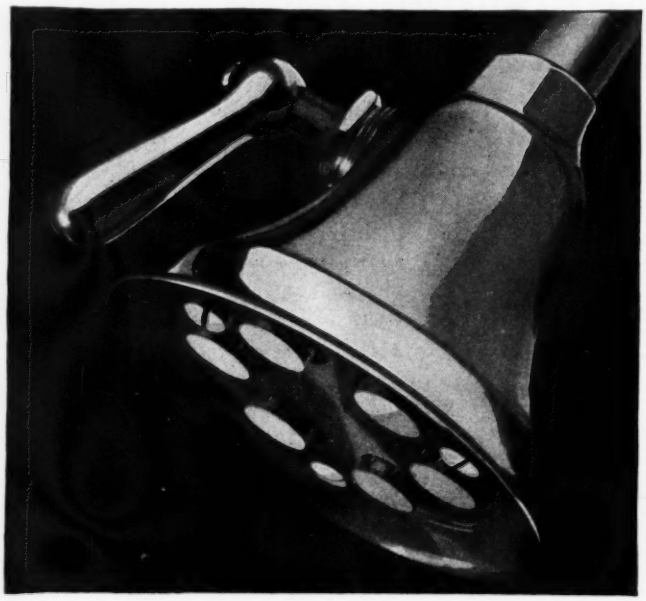
The WEATHER is your best SALESMAN

. . . and this fast-selling, revolutionary new shower head will boost your summer profits

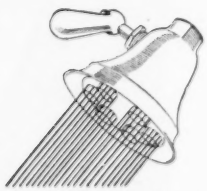
THOUSANDS of successful Master Plumbers are letting the weather help them to make new profits. For hot weather is, above all, shower time. People use showers more. And they respond instantly to the superiorities of the new Speakman Self-cleaning Shower Head—like no other ever put on the market.

This ingenious shower head has two outstanding features. It can be flushed clean of clogging sediment with a turn of the handle. And it is adjustable spraying—giving any kind of a shower you want.

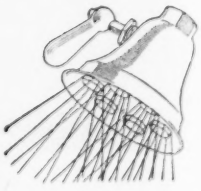
Order a supply from your distributor now. Have your journeymen carry them and show them to customers. Beautifully finished in brilliant Speakman chromium plate, they are the fastest-selling replacement items Speakman has ever offered the Master Plumber. Speakman Company, Wilmington, Del.



A turn of the lever sluices all sediment away.



Another turn of the lever gives a normal spray.



Or you can adjust to a veritable stinging needle shower.

SPEAKMAN
SHOWERS & FIXTURES

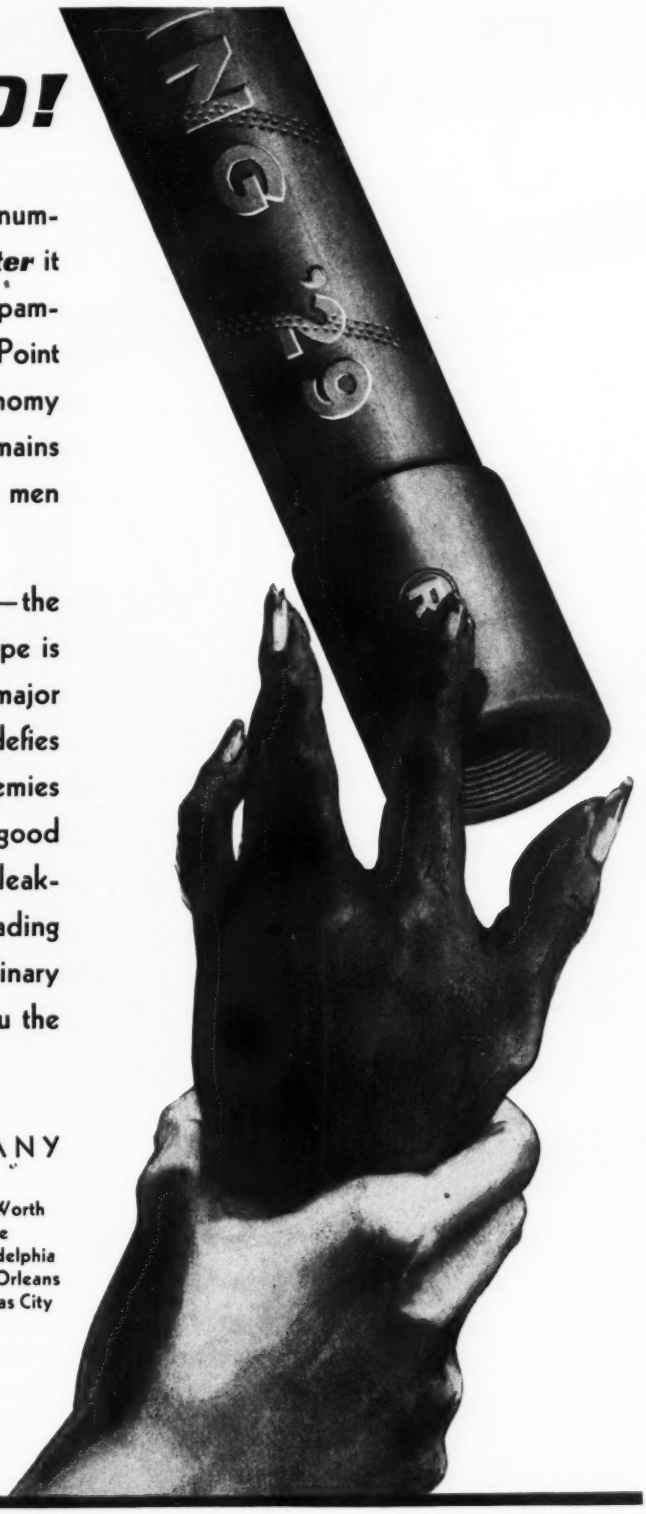
UNTOUCHED!

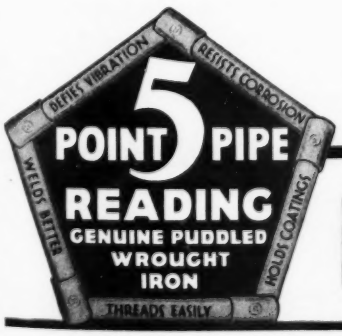
JUDGE the true worth of pipe by the number of hands that must touch it ***after*** it is installed. Pipe that needs constant pampering does not pay out. Reading 5-Point Pipe has established its record of economy on the fact that, once installed, it remains ***untouched*** by the hands of repair men during a long, long period of service.

Genuine Puddled Wrought Iron—the material of which Reading 5-Point Pipe is made—inherently possesses all of the major qualities that make pipe endure. It defies corrosion and vibration—the chief enemies of pipe vitality. It is famous for its good threading, insuring permanently tight, leak-proof joints. And double welded Reading Pipe costs no more to install than ordinary cheap pipe. We'll be glad to give you the profitable facts—write us today.

READING IRON COMPANY
Reading, Pennsylvania

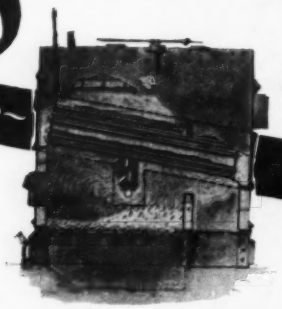
Atlanta	Cincinnati	Pittsburgh	Fort Worth
Baltimore	Detroit	Cleveland	Seattle
Boston	Houston	St. Louis	Philadelphia
Buffalo	Los Angeles	Tulsa	New Orleans
Chicago	New York	San Francisco	Kansas City



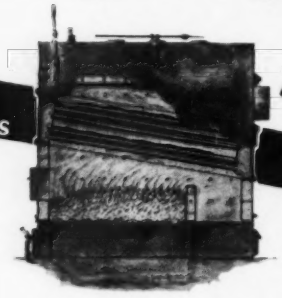


GENUINE PUDDLED WROUGHT IRON
READING PIPE
DIAMETERS RANGING FROM ⅛ TO 20 INCHES

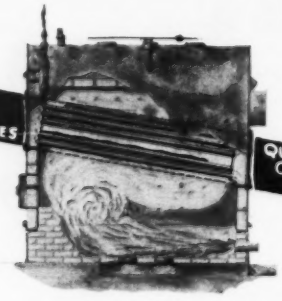
Smokeless



Direct Draft



for Oil and Gas



FOR EVERY HEATING NEED -

the KNOWLTON BOILER

Specialization—the password of the modern age—has been applied rightfully to heating.

Selecting a particular type boiler for the particular type installation is as important a factor in good heating engineering as the actual installation itself.

Knowlton Boilers cover the varied specifications as perfectly as they burn fuel. Their employment denotes, not only thorough heating knowledge, but also shrewd judgment in economy.

ORR & SEMBOWER, INC.
READING, PENNSYLVANIA
208 N. Clinton St., Chicago 50 Church St., New York

COMPLETE · HEATING · SATISFACTION

What's the Reason for Sherwood Success?

Back of the success of any commodity is always a story of service and satisfaction.

When Sherwood started to build ball cocks, it was with the knowledge that many ball cocks which the plumber was asked to buy were not of the kind that could ever build a reputation for service or satisfaction.

Sherwood determined to eliminate leaks and whistling and gurgling from its ball cock. It determined to make it one that would close against any city water pressure. And Sherwood determined to build its ball cock at a price that would put it within the reach of every installation, no matter how modest.

Sherwood's success is explained by the fact that it has unfailingly lived up to its promise to provide a good ball cock.

Plumbers everywhere have come to know Sherwood for a ball cock of highest quality. They demand it for all of their work.

SHERWOOD BRASS WORKS

Jefferson and Mt. Elliott Aves. **DETROIT, MICH.**

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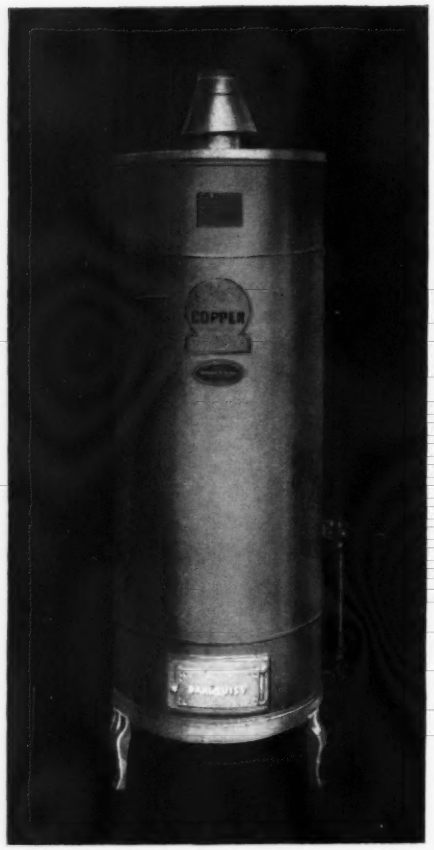
E. S. Thompson, 2401 Chestnut St., Philadelphia

Fred G. Hoffman, 831 Edgewood Ave., Trenton, N. J.

Fred S. Wilsey, Plymouth Bldg., Minneapolis



The Dahlquist Storage Hot Water Heater includes a heavy duty Anaconda Copper tank which is absolutely rustless. It assures clean, clear water always. Completely automatic, the Dahlquist is a fool-proof, efficient water heater which provides a continuous, instant supply of piping hot water at lowest fuel cost.

A COPPER WATER HEATER AT $110

Write or wire for particulars to
DAHLQUIST SALES CORP.
287 Spring St., New York City

Listing at only $110 for the 20-gallon size (and correspondingly low prices for all other sizes) the Dahlquist represents a golden opportunity for you to handle a fast-selling water heater. Your customers will instantly appreciate the advantages of this superior water heater with its rustless Anaconda Copper tank and many other unique construction features. Our liberal discounts assure dealers and jobbers a generous margin of profit.

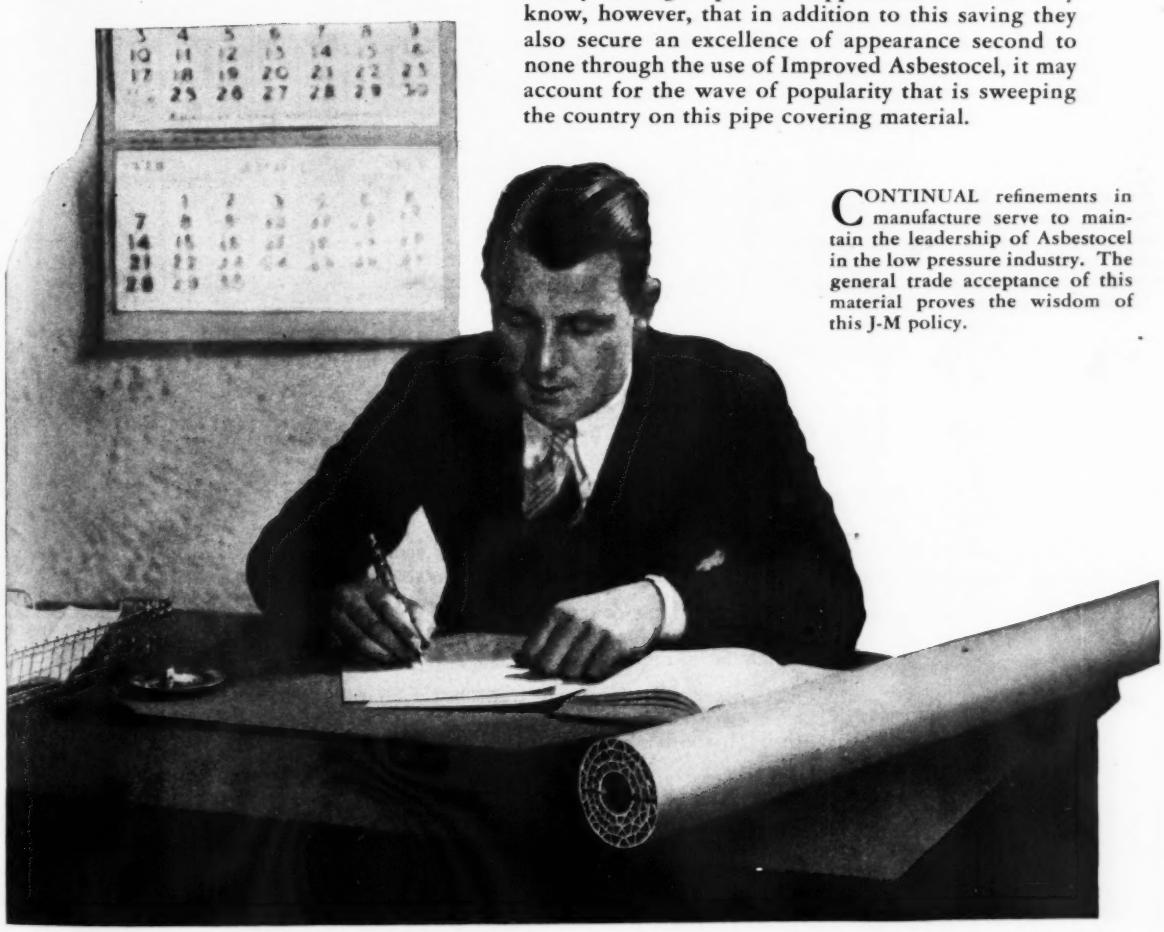
DAHLQUIST
ANACONDA COPPER
WATER HEATER

You can estimate on Asbestocel *Safely*

WISE contractors have learned the value of figuring on Improved Asbestocel for their jobs. They know this pipe covering is as consistent in its quality as the calendar.

As a consequence, having learned through experience that this red-banded covering goes on quicker, resulting in a clean, round, good looking job,—they have also learned the economy associated with its use. When time is an important element in the job—and that means every job—the pipe covering, regardless of its other qualities, which can be applied in the quickest time and with the best results is the one which nets the contractor the largest profits.

Most contractors strive to use materials that save money through speed in application. When they know, however, that in addition to this saving they also secure an excellence of appearance second to none through the use of Improved Asbestocel, it may account for the wave of popularity that is sweeping the country on this pipe covering material.



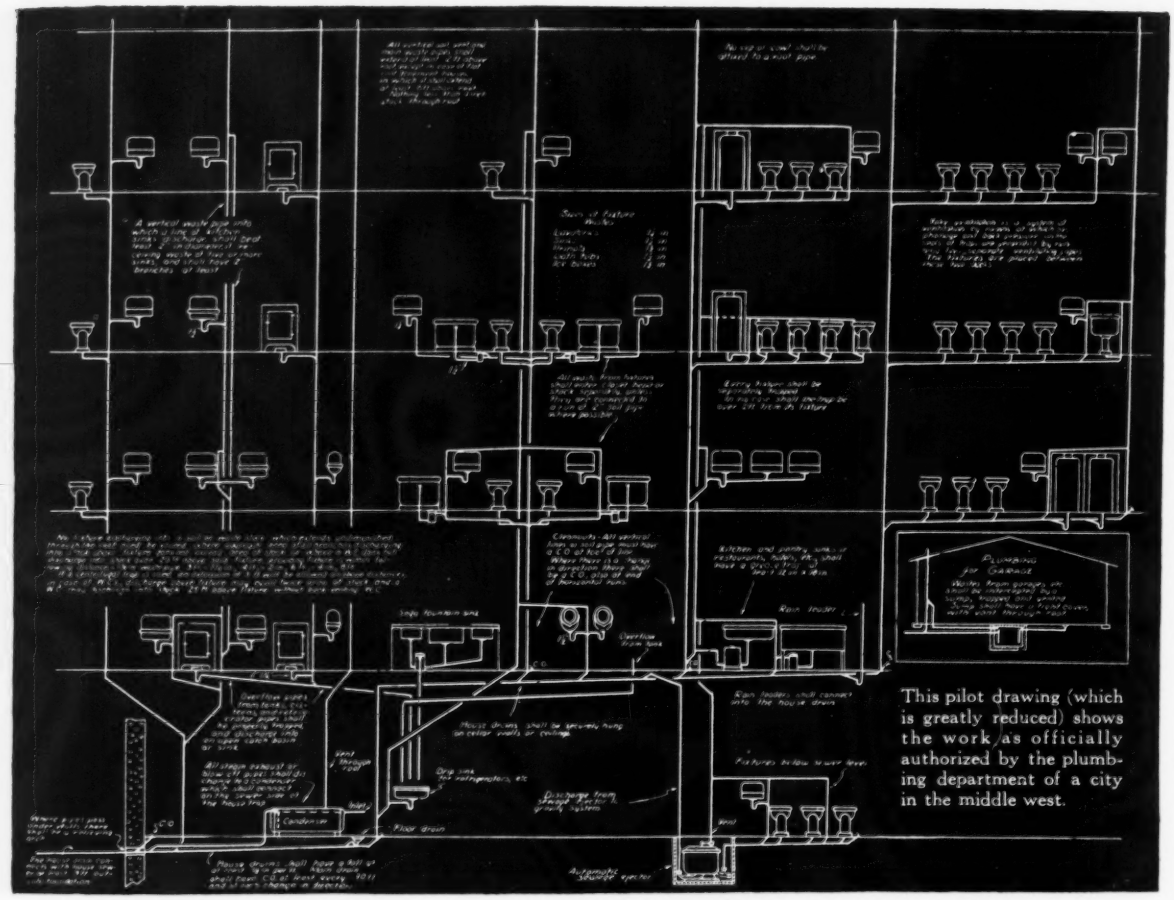
CONTINUAL refinements in manufacture serve to maintain the leadership of Asbestocel in the low pressure industry. The general trade acceptance of this material proves the wisdom of this J-M policy.

Johns-Manville
IMPROVED ASBESTOCEL

JOHNS-MANVILLE CORPORATION
New York Chicago Cleveland San Francisco Toronto
(*Branches in all large cities*)
Please send me complete information about "Improved Asbestocel."

*Name*_____ A-61-7

*Address*_____



This pilot drawing (which is greatly reduced) shows the work as officially authorized by the plumbing department of a city in the middle west.

Pilot Drawings Simplify Your Work

All regulations, whether printed in code or verbally demanded, are plainly illustrated in a pilot drawing. They are easily understood by either master, journeyman or apprentice.

They are a big help in selling, estimating and installing. They help to visualize the work that is to be done and eliminate all chance and guesswork. They save expensive delays and mistakes by workmen.

STATES

Indiana
Ohio
Pennsylvania

Proposed Texas Code Recommendations of Master Plumbers' Association of New Jersey.

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Georgia:
Atlanta
Augusta

Indiana:
Indianapolis

Kentucky:
Paducah

Michigan:
Battle Creek
Flint
Kalamazoo
Lansing

New Jersey:
Arlington
Asbury Park
Atlantic City
Balmar
Bloomfield
Caldwell
Camden
Carlstadt
Cliffside
Deal
East Orange
East Rutherford
Elizabeth
Garwood
Grantwood
Guttenberg
Harrison
Hasbrouck Heights
Hillside
Irvington
Kearney
Kenilworth
Linden
Lyndhurst
Montclair
Moonarchie
North Arlington
North Bergen
Orange
Plainfield
Roselle
Roselle Park
Cranford
Rutherford
South Orange
Town of Union
Verona
Wellington
Weehawken
Westfield
West New York
West Orange
Woodbridge

Ohio:
Akron
Dayton
Toledo

Pennsylvania:
Allentown
Altoona
Bethlehem
Easton
Lancaster
New Castle
Washington
York

Virginia:
Roanoke

Every plumbing contractor should have a pilot drawing for every city or town in which he is registered.

Authorized pilot drawings that have been checked and approved are now available through the book department of DOMESTIC ENGINEERING for the states and cities shown in the adjoining column. They come in blueprint form, size 22 x 28 inches. The price of each is $2.50. If purchased in quantities of 12 or more the price is $2.00 each.

Order the pilot drawings you need now. They will save time for you everyday.

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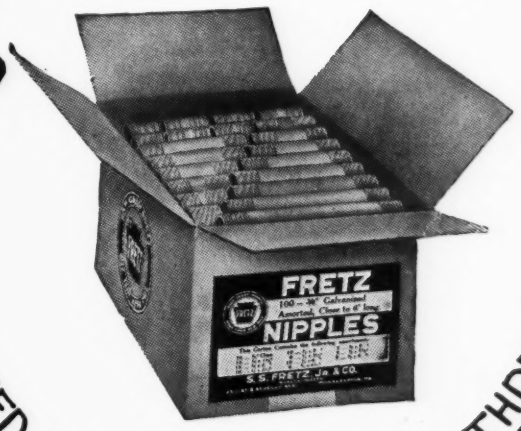

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THE Wall Cabinet Heater — built only by Modine—conforms to the most exacting demands of modern room decoration, but its cost makes it the most economical installation where utility is the prime consideration.

Because of the inclined position of its enclosed copper radiator, it extends only a few inches from the wall and is particularly desirable where space economy is necessary. It is the ideal radiation for smart shops, department stores, offices, hospitals, apartments and homes.

Complete information on Modine Cabinet Heaters and Modine Wall Type Cabinet Heaters will be sent on request.

Send for your copy of our new 4-color Booklet "Modine Cabinet Heaters". In addition to construction details and capacity details, it has numerous suggestions for Modine Cabinet Heaters in the decorative scheme.

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Originators of
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Manufacturers of
MODINE UNIT HEATERS

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These sheets are reprints of catalog pages appearing in "Domestic Engineering Catalog Directory." They conform to the standards adopted by the plumbing and heating industries, as to page size, punching and weight of stock. "Domestic Engineering" also handles the Speedlok binder which is especially designed to hold standardized sheets. The price of the binder is $3.00.

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Acme Frost Proof Closet Mfg. Co. ..... Baltimore, Md.
Acme Refining Co., The ..... Cleveland, Ohio
Alamo Engine Co. ..... Hillsdale, Mich.
Alberene Stone Co. ..... New York City
Alliance Tank Co. ..... Alliance, Ohio
American Beauty Stove Co. ..... Erie, Pa.
American Brass Co. ..... Waterbury, Conn.
American District Steam Co. ..... North Tonawanda, N. Y.
American Manganese Bronze Co. ..... Holmesburg, Pa.
American Pipe Tool Co. ..... Chicago, Ill.
American Radiator Co. ..... New York City
American Steam Pump Co. ..... Battle Creek, Mich.
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Armstrong Mfg. Co. ..... Bridgeport, Conn.
Artisan Metal Products Co. ..... Charlestown, Mass.
Atchison Specialty Mfg. Co. ..... Atchison, Kans.
Atkins Mfg. Co., H. C. ..... St. Louis, Mo.
Atlantic Tubing Co. ..... Providence, R. I.
Atlas Brass Foundry Co. ..... Columbus, Ohio
Automatic Gas Steam Radiator Co. ..... Pittsburgh, Pa.

Badger & Sons Co., E. B. ..... Boston, Mass.
Ballantine, B. D. ..... Fitchburg, Mass.
Baltimore Valve Corp. ..... Baltimore, Md.
Barnes Tool Co., The ..... New Haven, Conn.
Barrett Mfg. Co., James ..... Boston, Mass.
Bay Ridge Specialty Co., Inc. ..... Trenton, N. J.
Bead Chain Mfg. Co. ..... Bridgeport, Conn.
Beardsley & Wolcott Mfg. Co., The ..... Waterbury, Conn.
(Successors to Berbecker & Rowland Mfg. Co.)
Beaton & Cadwell Mfg. Co., The ..... New Britain, Conn.
Beaton & Corbin Mfg. Co., The ..... Southington, Conn.
Beilman Water Heater Co., Inc., The ..... Buffalo, N. Y.
Bell & Gossett Co. ..... Chicago, Ill.
Beneke Mfg. Co. ..... Chicago, Ill.
Benson Co., Inc., Alex R. ..... Hudson, N. Y.
Bignall Co., The ..... Medina, N. Y.
Blue Seal Chemical Co. ..... Roselle, N. J.
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Borden Co. ..... Warren, Ohio
Bowlus Mfg. Co., The ..... Springfield, Ohio
Boyle & Co., Inc., C. A. ..... Chicago, Ill.
Bradley Washfountain Co. ..... Milwaukee, Wis.
Brunswick-Kroeschell Company ..... Chicago, Ill.
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Buffalo Meter Co ..... Buffalo, N. Y.
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Butler Mfg. Co. ..... Minneapolis, Minn.
Butler, Thos. F. ..... Lorain, Ohio

Cabco Iron Works, Inc. ..... Gowanda, N. Y.
Capitol Brass Works ..... Detroit, Mich.
Carty & Moore Engineering Co., Inc. ..... Detroit, Mich.
Case & Son Mfg. Co., W. A. ..... Buffalo, N. Y.
Celina Mfg. Co. ..... Celina, Ohio
Central Foundry Co. ..... New York City
Central Radiator Co. ..... New York City
Central Specialty Co. ..... Detroit, Mich.
Chamberlain Co., The ..... Pittsburgh, Pa.
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Chemical Toilet Corp. ..... Syracuse, N. Y.
Chicago Faucet Co., The ..... Chicago, Ill.
Chicago Flexible Shaft Co., (Sprinkler Division) ..... Chicago, Ill.
Chicago Granitine Mfg. Co. ..... Chicago, Ill.
Chicago Pipethread Machine Co. ..... Racine, Wis.
Chicago Pump Co. ..... Chicago, Ill.
City Brass Corp. ..... New York City
Cleveland Brass Mfg. Co., The ..... Cleveland, Ohio
Cleveland Heater Co. ..... Cleveland, Ohio
Columbia Radiator Co. ..... McKeesport, Pa.
Comet Radiator Co. ..... Philadelphia, Pa.
Commonwealth Brass Corp. ..... Detroit, Mich.
Compound Injector & Specialty Co. ..... Chicago, Ill.
Conemaugh Iron Works ..... Latrobe, Pa.
Connors Paint Mfg. Co., Wm., The ..... Troy, N. Y.

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Crist & Schilken Co. ..... Pittsburgh, Pa.
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d'Este Co., Julian ..... Boston, Mass.
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Duro Wood Products, Inc. ..... Capac, Mich.

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Eljer Co. ..... Ford City, Pa.
Elkay Mfg. Co. ..... Chicago, Ill.
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Elkhart Iron Works ..... Elkhart, Ind.
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Enterprise Brass Works ..... Muskegon, Mich.
Erie Tool Works, The ..... Erie, Pa.
Estabrook's Sons, R. ..... South Boston, Mass.
Ever-Ready Gas Heater Valve Co. ..... Detroit, Mich.
Excelsior Leather Washer Mfg. Co. ..... Rockford, Ill.
Excelso Products Corp. ..... Buffalo, N. Y.
Exeter Brass Works ..... Exeter, N. H.

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Ferguson & Lange Foundry Co. ..... Chicago, Ill.
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Goulds Pumps, Inc. ..... Seneca Falls, N. Y.
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Hays Mfg. Co. ..... Erie, Pa.
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Healy-Ruff Company ..... St. Paul, Minn.
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Hetzel, J. G., Estate of ..... Newark, N. J.

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Hotstream Heater Co. ..... Cleveland, Ohio
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Jones Hollow Ware Co. ..... Baltimore, Md.
Josam Mfg. Co. ..... Cleveland, Ohio
Judd Co., H. L. ..... New York City

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Marvel Machine & Brass Works ..... Cleveland, Ohio
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Michigan Pipe Co. ..... Bay City, Mich.
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Milwaukee Valve Co. ..... Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co. ..... Minneapolis, Minn.
Misener & Irving Mfg. Co., Inc. ..... Syracuse, N. Y.
Modern Iron Works ..... Quincy, Ill.
Modine Mfg. Co. ..... Racine, Wis.
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Morton Mfg. Co. ..... Chicago, Ill.
Muller, Edward ..... North Bergen, N. J.

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Neptune Meter Co. ..... New York City
Never Rust Co. ..... Harrisburg, Pa.
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Newark Brush & Scraper Co. ..... Irvington, N. J.
New Britain Machine Co. ..... New Britain, Conn.
Newbury Mfg. Co. ..... Monroe, N. Y.
Newbury & Son, Jay H. ..... Goshen, N. Y.
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Ohio Heater Co., The ..... Columbus, Ohio
Olsen, H. T ..... New York City

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Quad Stove Mfg. Co., The ..... Columbus, Ohio
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Radiator Specialty Co ..... Charlotte, N. C.
Randolph-Clowes Co., The ..... Waterbury, Conn.
Rathbun Products, Inc ..... Detroit, Mich.
Rawlplug Co., Inc., The ..... New York City
Reed Mfg. Co. ..... Erie, Pa.
Reinhard Mfg. Co., Edwin G ..... Cincinnati, Ohio
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Richmond Foundry & Mfg. Co., Inc ..... Richmond, Va.
Ridge Tool Co. ..... Elyria, Ohio
Riverside Boiler Works, Inc ..... Cambridge, Mass.
Riverside Foundry & Galvanizing Co ..... Kalamazoo, Mich.
Robbins, Gamwell & Co ..... Pittsfield, Mass.
Rockford Brass Works ..... Rockford, Ill.
Rock Island Mfg. Co. ..... Rock Island, Ill.
Royal Brass Mfg. Co., The ..... Cleveland, Ohio
Rumsey Pump Co., Ltd. ..... Seneca Falls, N. Y.
Russell Mfg. Co., Inc., John M ..... Naugatuck, Conn.
Russell & Co., W. A. ..... New York City

Sands Mfg. Co. ..... Cleveland, Ohio
Sanitary-Dash Corp. ..... New York City
Sanitary Engineering Co ..... Pittsburgh, Pa.
Sarco Co., Inc. ..... New York City
Scadron Brothers ..... New York City
Scaife & Sons Co., Wm. B ..... Oakmont, Pa.
Scientific Heater Co. ..... Cleveland, Ohio
S. E. T. Valve & Hydrant Co. ..... New York, N. Y.
Self-Cleaning Strainer Co. ..... Chicago, Ill.
Selfridge-Norton Mfg. Co ..... Cleveland, Ohio
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Sherwood Brass Works ..... Detroit, Mich.
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Standard Elsmere Granite Co ..... Chicago, Ill.
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Standard Water Systems Co. of N. J. ..... Hampton, N. J.
Stark Pump Co. ..... Detroit, Mich.
Sterling Faucet Co ..... Newcomerstown, Ohio
Stoll, Chas. J. ..... New York City
Stringer Brothers Co. ..... Chicago, Ill.
Structural Slate Co ..... Pen Argyl, Pa.
Stuart & Co., D. A. ..... Chicago, Ill.
Swett Iron Works, A. L. ..... Medina, N. Y.

Taco Heaters, Inc. ..... New York City
Taylor Co., Halsey W., The ..... Warren, Ohio
Teck Manufacturing Co. ..... Chicago, Ill.
Teekorator, Inc ..... Rochester, N. Y.
Tillery's Little Janitor Clock Co. ..... Newark, N. J.
Titchener & Co., E. H. ..... Binghamton, N. Y.
Trageser Steam Copper Works, John ..... Maspeth, N. Y.
Trenton Brass & Machine Co ..... Trenton, N. J.
Trimont Mfg. Co., Inc. ..... Boston, Mass.
Troop Water Heater Co. ..... Pittsburgh, Pa.
Tryco Products, Inc ..... Westfield, Mass.

Utility Laboratory, Inc. ..... Brooklyn, N. Y.

Van Arnam Mfg. Co. ..... Fort Wayne, Ind.
Vanderman Mfg. Co ..... Willimantic, Conn.
Vinco Co., Inc. ..... New York City
Vitreous Enameling & Stamping Co., Inc. ..... New York City
Vogel Co., Joseph A. ..... Wilmington, Del.
Vulcatex, Inc ..... Chicago, Ill.

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Walker Dishwasher Corp. ..... Syracuse, N. Y.
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Ware Coupling & Nipple Co ..... Ware, Mass.
Warnock Manufacturing Co ..... Worcester, Mass.
Warren Electric Appliance Co. ..... Warren, Pa.
Washington Metal Products Co ..... Washington C. H., Ohio
Water Works Equipment Co., Inc. ..... New York City
Watts Regulator Co. ..... Lawrence, Mass.
Weis Mfg. Co., Inc., Henry ..... Elkhart, Ind.
Wesely Co., Chas. ..... Chicago, Ill.
Wessels & Sons, D. D. ..... Detroit, Mich.
Western Wire Products Co. ..... St. Louis, Mo.
Wheeling Machine Products Co ..... Wheeling, W. Va.
White Flush Valve Mfg. Co. ..... Denver, Colo.
White Steel Sanitary Furniture Co ..... Grand Rapids, Mich.
Whitlock Coil Pipe Co. ..... Hartford, Conn.
Wilks Mfg. Co., S. ..... Chicago, Ill.
Worcester Brush & Scraper Co. ..... Worcester, Mass.

"X" Laboratories ..... New York City

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National Advertising— *part of our sales plan to help you*

THE SATURDAY EVENING POST February 26, 1929

IT IS A TEST FOR HOUSEHOLD CLEANLINESS - *what does it tell in your home?*

IF THERE is one thing that "places" a family's standard of living it is the manner in which they keep house. The bathroom, most of all, is a clue to the standards of the household, and the most conspicuous thing in the bathroom is the toilet seat. This piece alone is often the flaw in an otherwise presentable house and one which is sure to lead to unfavorable impressions. Fortunately, such a defect may be obviated easily and inexpensively.

A handsome Church Toilet Seat, strong, uncrackable, smooth as glass, may be fitted to any make of bowl in ten minutes with the help of only a pair of pliers. As readily as the rest of your furniture, it goes with you when you change residence.

You will find that Church Sani-White Seats are now the usual installation in modern homes and apartments. Your neighboring plumbing establishment has them on display.

Also in nine modern colors

On a wave of deserved popularity, Church colored seats have been swept into those interesting homes that are so effectively bringing color into every room. These seats are now available in nine pastel shades and nine sea-pearl tints. This wide range of beautiful colors permits one to manage just the right color scheme for the particular bathroom.

Ever-durable

Like the Sani-White Seats, the colored seats are definitely guaranteed not to crack, splinter or tarnish. This is also true of Church bath chairs and stools. The covering on them is not a paint, lacquer or enamel. It is solid, and has no joints in which germs or dirt can lodge. After years of service this covering will remain sanitary and free from blemish. Write for illustrated folio. C. F. Church Mfg. Co., Dept. S-2, Holyoke, Massachusetts.

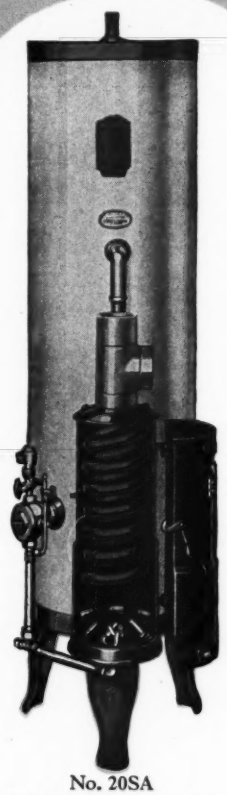
Church Seats
sani-
"Toilet Seats for Better Bathrooms"
Sold by all plumbing stores since 1898

THIS full-page advertisement appeared in *The Saturday Evening Post, Good Housekeeping, House and Garden, House Beautiful, Country Life* and *The American Home*. It is a sample of the extensive advertising campaign that forms a part of the well-rounded scheme for helping the dealer sell Church Seats. Every advertisement carries this phrase in bold-face type: "Sold by All Plumbing Stores."

And Church Toilet Seats have become the largest-selling toilet seats in the world. They are the usual specification of architects. They are preferred by builders, contractors and home owners. Thousands of them are sold over the counter by the dealers of the nation, bringing them quick and easy profits. Have you taken advantage of our Resale Service Plan, available to all plumbers? If not, send the coupon below.

C. F. CHURCH MANUFACTURING COMPANY
Dept. 2-7-4, Holyoke, Mass.
Gentlemen:
Kindly send me your complete Resale Service Plan for Church Seats.
Name_____
Address_____
City_____ State_____
Wholesaler's name_____

Church Seats
sani-
"Toilet Seats for Better Bathrooms"
(Established 1898)



No. 20SA
List Price $66, Complete

Why the "Side Arm" Automatic Storage Heater Is SUPERIOR

There are definite, tangible reasons why the "Side Arm" Automatic Storage Heater, as Hotstream builds it, is superior to the "Internal" Type.

Here are a few of them:

Gives uninterrupted satisfactory and efficient service over the greatest number of years.

No fire under the tank means 3 times longer service.

The cold water inlet being above the sediment line means that *clean water only* is heated.

The tank does not become insulated from within as a result of mud deposits.

The only part which might ever need replacing is the heater coil which can be changed easily and cheaply, thus making the entire Heater as good as new.

Can also be operated either as an Automatic Heater or as a tank heater.

All parts are more accessible.

Heating is faster and more economical.

Hot Water is delivered to the top of the tank instead of the bottom, which means quick recovery.

Insulation is much more effective than with other types, because no chilling drafts can circulate either around or through the center of the tank.

Get the full story—write TODAY to

THE HOTSTREAM HEATER CO.
"Makers of Heaters That Heat"
CLEVELAND, OHIO

HOTSTREAM
AUTOMATIC STORAGE
HEATERS

What a help to the householder's pocket-book—this new model Climax Cellar Drainer. What a relief not to worry about the cellar during the heavy rains and those weeks of sodden, melting snow—what a joy to find that a warm dry cellar represents but a few cents on the water bill.

MOST ECONOMICAL!

~ the new model CLIMAX Cellar Drainer!

A cellar permanently dry—practically no difference on the water bill—that's what interests the householder. No more walking a plank to the furnace or sloshing around in a wet coal bin for him—not after you install this new Climax. That's what sells this drainer—many of them—when one man recommends it to his friends.

Its low first cost — most economical operation—its absolute guarantee of customer satisfaction—the profit it offers—its ability to bring you new trade—are but a few of the reasons why plumbers everywhere now recommend the new model Climax Cellar Drainer.

Today—get our pamphlet on the construction of the drainer and how it works. This Fall—cash in with the new model Climax!

These are the reasons for the instant popularity of the new Climax Drainer.

Simple in Construction

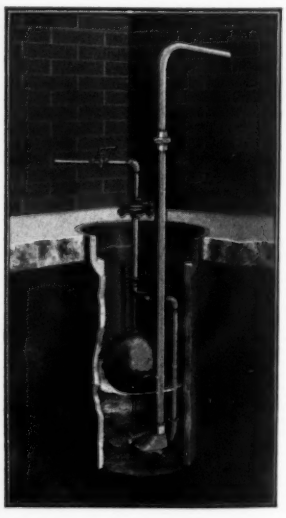
Easy to Install

Compactly Designed

No Adjustments

Efficient Operation

Most Economical!



Manufactured by the makers of the nationally known Climax Test Plugs for high or low pressure water, gas or steam lines and all types of pipe.

THE C. M. KEMP MFG. CO.

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Cleveland, Ohio—John W. Stiles & Son, 700 Prospect-Fourth Building
Chicago, Ill.—Oscar C. Anderson, 1146 W. Lake St.
St. Louis, Mo.—W. F. Harper, 3733 Lindell Blvd.
San Francisco, Calif.—Wm. P. Horn Co., 58 Federal Street
Los Angeles, Calif.—Wm. P. Horn Co., 509 Wilcox Bldg.
Seattle, Wash.—Wm. P. Horn Co., L. C. Smith Building

Advertising Is a Specialist's Job

THE man who laid out this ad is a specialist. He knows the printer's types by their first names. He knows how to make your eye travel to the precise point he wants it to travel. He knows how to take the copy for this ad and make its essential points stand out so that you will "get them" in a glance. He knew just how this ad was going to look in type before he gave it to the printer.

The man who wrote this copy is a specialist. People say that he knows all the parts of speech in the English language. He knows enough six-cylinder words to mix with his one-cylinder words so he has what is known in baseball as a "change of pace."

You are a specialist. You know how much radiation you will need to heat a room of a certain size, etc., and you know all about vents, and soil stacks and the other gadgets in plumbing installations.

The advertising specialists call you in when they want a plumbing or heating job they know will work. They figure, naturally, that you ought to call them in when you want an advertising job that will work.

So, in each issue of "Domestic Engineering" you find the Retail Advertising Service. It carries newspaper ads, sales letters, short publicity items, copy for circulars and suggestions for window displays, made up by the two specialists mentioned with the help of a third — the artist who makes the illustration.

The cost of that service is $4.20 for twelve weeks. In other words, we charge you 35 cents for the cut each week. We send you two new illustrations every other week and a reprint of the page. All you do is hand them to your local newspaper and your advertising job for the week is finished.

Here's the form that will give you the service of these specialists for the next twelve weeks. After that you'll never want to be without their help.

Tear out and mail this coupon—now!

DOMESTIC ENGINEERING,
1900 Prairie Ave., Chicago

Please enter my order for three months' use of your Retail Advertising Service.

I'm going to advertise!

Name .....

City and State .....

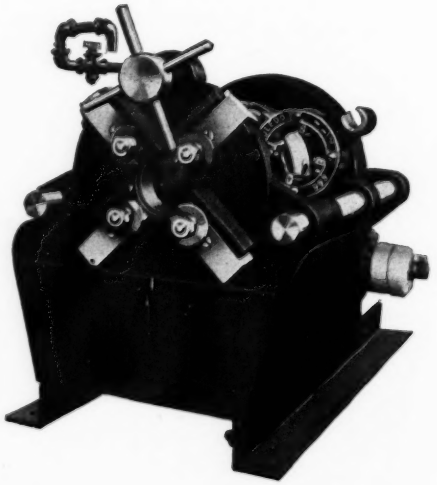
"TOLEDO" No. 999—

A REAL ½" TO 2" POWER PIPE MACHINE THAT IS EASILY CARRIED BY 2 MEN.

Here, at last, is the really portable, high-production, efficient, power pipe machine for cutting and threading ½-in. to 2-in. pipe.

It is but 32 in. long, 16 in. wide, 20 in. high. It threads 2-in. pipe in 30 seconds, cuts off 2-in. in 15 seconds. Die heads changed instantly. No gears to shift. This new "TOLEDO" No. 999 is the small power pipe machine you have been waiting for.

A post card to us brings you complete information on this sensational new small pipe machine, that will help you cut your piping costs.



Net Price Complete $275.00
[West of Rockies $288.75]
F. O. B. Toledo, O., or Your Jobber's Stock

THE TOLEDO PIPE THREADING MACHINE CO. TOLEDO, OHIO

NEW YORK OFFICE: 72 LAFAYETTE STREET

DOMESTIC ENGINEERING
Plumbing & Heating Contracting and Merchandising

Vol. 128, No. 2
Whole No. 1896

Chicago, Illinois
July 27, 1929

OBSERVATIONS

The Remodeling Idea

In commenting recently on the fact that there had been a recession of about six per cent in building activities in the first five months of this year, we called attention to the unimportance of this decrease when due consideration was given to the possibilities of the remodeling or modernizing idea.

DOMESTIC ENGINEERING has a natural pride in the fact that a number of months before the building industry came to the point of organizing its efforts along modernization lines, this publication had been calling the attention of its readers to this great market with its possibilities for expansion.

A Stabilizer

A recent and striking proof of the effectiveness of the remodeling idea as a stabilizer—as something more than a stabilizer, as a source of growth capable of absorbing almost any decrease in new building activities—is given by a letter from a manufacturer in the construction field.

An executive of this manufacturing company was most active in the organization of the remodeling efforts of the industry. His company has recognized from the outset the tremendous possibilities which lie in the old homes of America, as well as in the older business and industrial structures.

That letter, written in May of this year, said: "We are substantially 40 per cent ahead of last year for the same period," and indicating that the increase for the same period in 1928 had been only 8 per cent, said that the remodeling activity had been an important factor.

All over the country modernizing bureaus have been set up. Sometimes they are the outgrowth of co-operation on the part of local building interests. Sometimes newspapers start them and secure the co-operation of the local building people.

It makes no difference how they start. The important thing is that the plumbing and heating contractor ally himself with the modernizing activity in his community. If there is no bureau, then, by his own efforts, he can secure work in the older homes; and may use his efforts to induce his fellows in the building trade to co-operate, or to induce his local newspapers to get back of the movement.

When a manufacturer can so definitely assign a substantial increase in business to the remodeling idea, there is no reason whatever for the industry to worry about seasonal fluctuations of building, or even about a slowing up process, until population growth shall have absorbed present new building. The remodeling business is there. Widespread earning power, a substantial margin of income over necessities, is making possible all sorts of purchases which were once thought of as luxuries. All that is needed is an aggressive merchandising effort on the part of the plumbing and heating contractor, alone, or in co-operation with the rest of the building industry, to give him work in such quantity as will lay his worries in the dust. Those contractors who have paid attention to this development are satisfied with its possibilities. And when plumbing and heating firms, long established as contractors in the sense that they handled almost entirely only new work, turn to the building up of remodeling business as profitable, there is ground for accepting this new development as worthy of attention.

A Source of Profit

Better Trade Practices

It is obvious that conditions throughout the building industry must be corrected if it is to reap its just reward for what it is contributing to the material comfort of America. Such activities as the trade practice conference in our industry, held in Pittsburgh in May, must be extended, in one form or another so that the practices which have had such an unfortunate effect during the boom years of building may be eradicated.

At the national conventions both of the plumbing group, and of the heating group, the contractors decided to take steps looking toward a trade practice conference. Recently there came the announcement of the formation of the Institute of Boiler and Radiator Manufacturers, which plans to set up an "Unfair Competition Bureau," with the idea in mind of getting at some of the abuses which, it is agreed on all hands, must be eradicated.

Steps Forward

Another heartening piece of news is contained in the announcement that a committee of the Associated General Contractors of America has undertaken to outline the principles of fair practice. At a meeting in May, five principles were decided upon, and they have been approved by the organization.

The principles have to do with the pro-rating of charges against sub-contractors, for charges arising under the "General Conditions" clause of specifications; a ruling as to who is to carry workmen's compensation and general public insurance; a pronouncement against using estimates from sub-contractors improperly; a requirement that notice of waiver of lien rights be given sub-contractors before entering into a contract with them; and a condemnation of the guaranteeing of accounts of general contractors by sub-contractors, or of sub-contractors by general contractors.

Underlying these five principles is one governing idea. That is, that general contractor and sub-contractor have certain duties and rights under agreements for the construction of buildings, and that it is better for all concerned if those duties and rights are kept rigidly separate.

The idea involved is very much like that of the separation of powers under the American Constitution, by which legislative, judical and executive powers are defined and their exercise rigidly apportioned.

When one party or the other to a building agreement encroaches on the activities of others, there is always danger of harmful practices. Such encroachment is involved in the guaranteeing of accounts; in the use of preliminary estimates from sub-contractors for the purpose of forcing lower prices; or the petty situation in which a general contractor tries to insist that all the necessary insurance on a building be placed through a certain agency.

For the Sub-Contractor

Members of our industry who do a type of work in which they act as sub-contractors would do well to take notice of the provisions set up by this committee of the national body of general contractors.

It is to be hoped that the course of time will see such a consciousness of the need for sane and sound business practices that the building industry as a whole will not be sacrificing its profits to the fetish of volume.

Our Oldest Reader

Recently we quoted from a letter received from a man who has been a consistent reader of DOMESTIC ENGINEERING for a great many years and suggested that it would be interesting to know who is our oldest reader. A letter has been received from Alex. Muirhead, president of Muirhead and Murhard Co., contractors of Portland, Ore. In that letter Mr. Muirhead calls attention to the fact that he became a subscriber to DOMESTIC ENGINEERING in 1890, during the national convention of the master plumbers in Denver. Since then, he says, "my firm has continued as reader-subscribers." We are sure that Mr. Muirhead has been not only a subscriber, but a reader; and we are sure of his interest, which is sufficiently indicated by his letter in answer to our editorial.

Since 1890

For the moment, then, Mr. Muirhead stands as our oldest reader; and, since DOMESTIC ENGINEERING was founded in October of 1889, it is reasonable to suppose that Mr. Muirhead's right to the title will not have much competition. We thank Mr. Muirhead for his interest in writing us; and we invite further letters from among those whose memory goes back so many years.

Raising the Qualifications

As we have pointed out before in these columns, if there were definite qualifications to be met before a man might assume the duties of a contractor, there would be less difficulty in the field. We have drawn the comparison with the professions, such as the medical and legal. Our problem is, of course, different than theirs in its details. Presumably, before a man can secure a license he must know his trade technically. But under modern conditions this is no longer sufficient. A man must be well versed in the science of business. Every city of any size has its business colleges where men with an ambition to become contractors can be grounded in the necessary business knowledge. Apprentices, too, should be required to devote some time to business subjects. Where bookkeeping classes have been organized, contractors already in the business have found value in them. Business training is an essential to success under modern conditions, and we hope to see, before long, definite steps taken to increase the number of men in the business who have a complete grasp of such practical economics as go to an understanding of costs, of selling and of efficient management.

Business Training

OBSERVATIONS by Our Readers

Editor, DOMESTIC ENGINEERING:—I can't hold out any longer, because I have won my bet. I made a wager with another plumber that, if I did not renew my subscription, you would keep on sending me letters until I did.

It all came about during a little discussion about keeping after your customers with a new circular every month. I said you are bound to get a return order if you do that, especially if you know that your work and material are of the first quality. And I must admit that your business paper is worth more than the price you charge for it. Personally I hope that your company will continue its good work for ever and, by so doing, help plumbers in distress.

Enclosed you will find check for a three-years' subscription, which I hope to use to good advantage.

My motto is: "Once a subscriber, always a subscriber," especially for DOMESTIC ENGINEERING.

Brooklyn, N. Y. C. M.

Determining Pipe Sizes *for* Hot Water Heating Systems

By F. E. GIESECKE and ELMER G. SMITH, College Station, Texas*

THE object of this investigation is to secure data which may serve as a basis for tables and graphs from which pipe sizes for hot water heating systems may be easily determined.

The heating systems studied were of the gravity flow type with under-foot main and of such size as to be suitable for residences of ordinary size.

Three varieties were studied, namely:

(a) A system with single main, as shown in Fig. 1.
(b) A system with double main and direct return, as shown in Fig. 2.
(c) A system with double main and reversed return, as shown in Fig. 3.

In each case the heater was located about 3 ft. 6 in. below the mains, the water was heated by means of steam and all pipes were bare. The temperature of the water was measured by means of ordinary mercury thermometers passing through rubber stoppers so that the thermometer bulb was immersed in the water.

The outstanding result of this investigation is the discovery that, for the type of system studied, the pressure heads produced by the individual radiators with their connecting pipe lines may be so large when compared with the pressure head produced by the heater with its main flow and return risers that they may interfere seriously with the proper circulation of the water in a gravity flow system of the type used in this investigation, if the pipe system has not been accurately designed and built.

These disturbing effects of the radiator pressure heads are particularly active during the heating-up periods of the operation of the heating systems. For example,

*Excerpt from paper presented at the Semi-Annual Meeting of the American Society of Heating and Ventilating Engineers, Bigwin Inn, Lake-of-Bays, Ontario, Canada, June 26, 27 and 28, 1929.

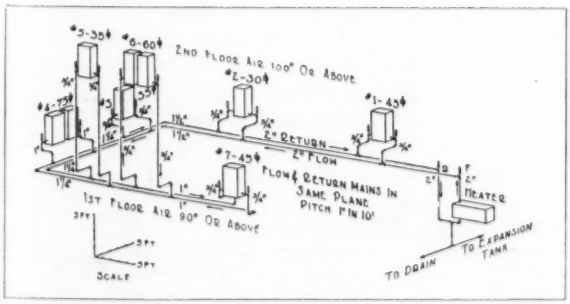


Fig. 2.—Experimental installation of a two-pipe direct-return system

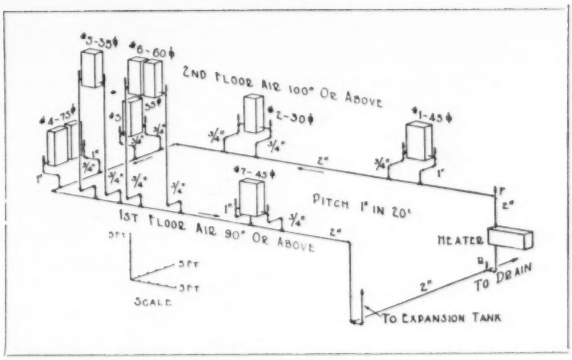


Fig. 1.—Experimental installation of a one-pipe system

in the system shown in Fig. 4, the pressure head produced by the heater tends to produce flow through the system in the directions shown by the straight line arrows. The pressure head produced by Radiator 1 tends to produce flow through the system in the directions shown by the wavy line arrows. The hot water reaches Radiator 1 before it reaches Radiator 2, and the pressure head of Radiator 1 becomes active as soon as its flow riser is filled with warm water. In the section between the heater and Radiator 1, the two pressure heads supplement each other, but in the sections between Radiator 1 and Radiator 2, they oppose each other. When the pressure head, in this section produced by Radiator 1 is larger than that produced there by the heater, the circulation through Radiator 2 will be *reversed,* and Radiator 2 will be supplied with water that has been cooled by flowing through Radiator 1. If the pressure head produced by Radiator 1 is not large enough to reverse the flow through Radiator 2 it may be large enough to retard the flow through that radiator materially.

The opposing pressure heads produced by intermediate radiators in two-pipe direct return systems may be largely responsible for the sluggish flow through the radiator farthest from the heater.

The *reversal* of flow through Radiators 5, 6, and 7 in the two-pipe direct return system is clearly shown in Fig. 21. However, this *reversal* was also found in Radiators 6 and 7 in the two-pipe reversed return system (the so-called, non-short-circuiting system) as shown in Fig. 15.

To prevent the *reversal* of flow in all parts of the heating system, the installation must be designed and executed so that at all points of every circuit the available pressure head will be of the direction necessary to produce the flow desired by the designing engineer.

The above explanation may be clearer if the heater and radiators are replaced by circulating pumps as shown in Fig. 5, or by electric generators, as shown in Fig. 6, and, in that case, electric currents substituted for streams of water.

To design heating systems of the types studied in this investigation it is evidently desirable to have the pressure head produced by the heater as large as possible and the pressure heads produced by the radiators as small as possible. These results can be attained in part by placing the flow and return mains as high as possible above the heater and as near as possible to the radiators, and

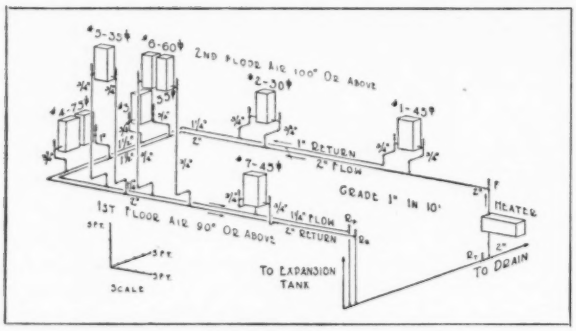


Fig. 3.—Experimental installation of a two-pipe reversed-return system

by attaching the flow and return risers to the bottom tappings of the radiators.

Experimental Installation and Operation

The purpose of the investigation is to secure data upon which simple tables and rules can be based which may be used by steamfitters in designing and planning hot-water heating systems.

Since the correct design of a large hot-water heating system is not very simple, it was decided to experiment first with a small system such as might be used in the ordinary one-family residence. It was assumed that it would be possible to prepare tables by which the ordinary one-pipe heating system could be designed, but since a properly operating two-pipe system possesses advantages over the one-pipe system, it was decided to experiment with a two-pipe system. One objection to the two-pipe reversed return was that the flow and return mains in the basement generally slope in opposite directions. This makes such a system a little more difficult to install and causes it to present a less attractive appearance than is the case with a direct return system. However, since many engineers believe that a system with a reversed return is less apt to short circuit than a system with direct return, it was believed that such a system would adapt itself more easily to design by means of tables or rules of thumb than would a direct return system. For this reason it was decided to begin the experiment with a reversed return system. It was felt that the objection to having the two mains sloping in opposite directions could be easily overcome by pitching both mains downward and connecting the far end of the flow main to the return, as shown in Fig. 3, so as to permit complete draining of the system when desired.

To arrive at some basis for an empirical table of pipe sizes, it was assumed that the distance from the center of the heater to the center of the flow and return mains would be about 3 feet 9 inches and that the temperature drop through the system would be about 30 degrees and that the total equivalent length of circuit of any radiator would be about 150 feet. For these conditions the total available pressure head[3] would be about 500 mil inches of water column and the permissible friction head in the pipe lines, about 3½ mil inches per foot.

For this condition the following table of pipe sizes[3] would apply:

Pipe Size	B.t.u.
¾	4,200
1	7,500
1¼	16,000
1½	24,000
2	44,000
2½	75,000

Using this table, the pipe sizes shown for the mains in Fig. 3 were selected.

No pipe smaller than ¾ inch was used and, consequently, all risers were made ¾ inch or larger.

In all tests, a heat exchanger was used as a heater and the water heated by means of steam having a pressure of 25 pounds or less. The installations were made in a building in which the air temperature ranged from 90 degrees to 110 degrees during the tests.

The system shown in Fig. 3, as first installed, had four radiators, Nos. 1, 2, 3, and 4, on the first floor, and

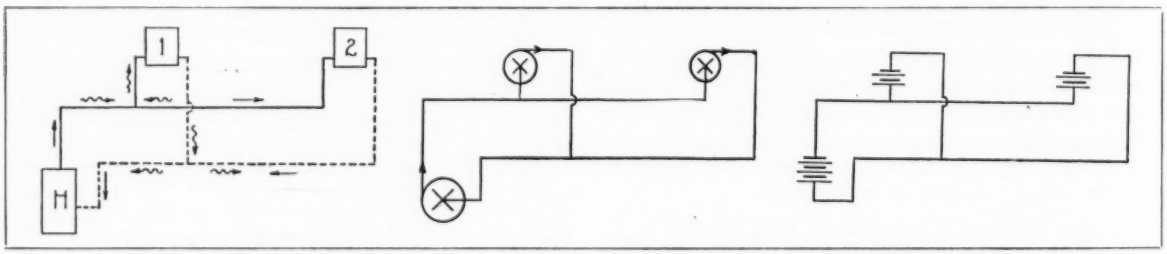


Fig. 4.—Diagram illustrating how the pressure head generated by one radiator may cause a reversal of flow in some other radiator

Fig. 5.—Circuit analogous to that of Fig. 4, the heater and radiators being replaced by centrifugal pumps

Fig. 6.—Electrical circuit analogous to that of Fig. 4, the heater and radiators being replaced by batteries

[3] These values were taken from the diagrams published in the 1929 Guide and in the Design of Gravity Circulation Water Heating Systems by F. E. Giesecke.

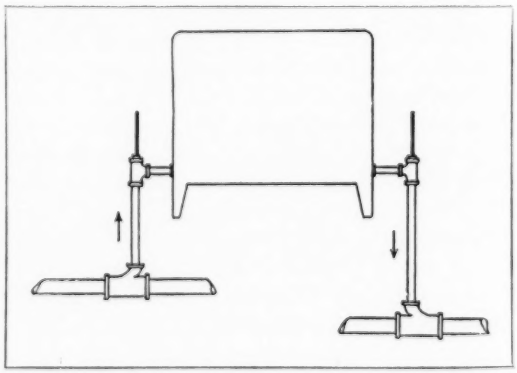


Fig. 7.—Method of installing long sweep tees in the reversed-return system

two radiators, Nos. 5 and 6, on the second floor. Radiator No. 7, as shown in the figure, was not at first installed.

When this system was put into operation Radiators

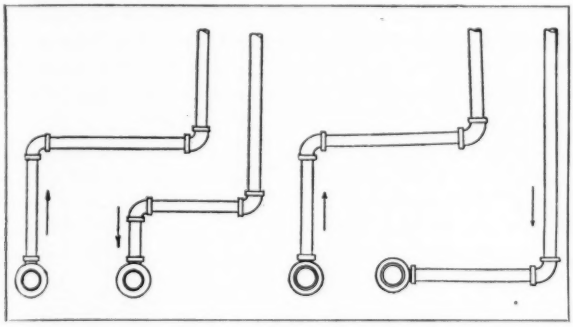


Fig. 8.—Riser connections to mains as originally made

Fig. 9.—Riser connections to mains as made in an attempt to prevent reversed radiator flow

1 to 4 operated correctly, but Radiators 5 and 6 did not. During every test run the flow of water was reversed either through Radiator No. 5 or through Radiator No. 6. Fig. 15 illustrates the records secured during one of these unsatisfactory tests. The flow was never in the same direction through both radiators at the same time; sometimes it would be direct through No. 5 and reversed through No. 6, and at other times, reversed through No. 5 and direct through No. 6.

In order to remedy this condition, the following changes were made: (1) The ordi-

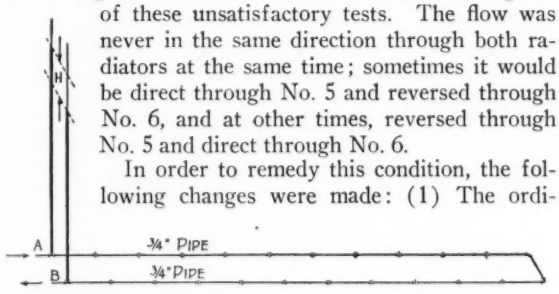


Fig. 10.—Apparatus for determining the friction head of an orifice

nary tees connecting the risers of Radiators 5 and 6 to the mains were replaced by long sweep tees, as shown in Fig. 7, in such a way that the friction in the circuit was materially increased whenever the direction of the flow was reversed.

This change had practically no effect; the flow continued to reverse in one of the two radiators, in spite of the additional friction caused by this reversal in the long sweep tees.

(2) The riser connections to the main were changed from that shown in Fig. 8 to those in Fig. 9. This change also had no apparent effect.

While the changes enumerated above were not effective, it seemed at times as if they were helping considerably, indicating that the direction of flow was unstable, and might be reversed by comparatively minor influences.

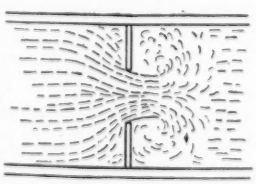


Fig. 11.—Flow of water through a submerged orifice

(3) Up to this time, the flow and return risers had been connected to the lower tappings of the radiators; as it seemed that the direction of the flow was unstable and that a small difference in pressure head or in friction head might serve to reverse the flow or to prevent reversal, the connections of the flow risers were changed from the lower tappings to the upper tappings of the radiators so that if a reversal of flow through any one radiator occurred, the hot water would have to enter that radiator through the lower tapping and the cooler water leave through the upper tapping. This change was also ineffective, and, in fact, it made conditions worse, as it resulted in a reversal of flow not only in Radiator No. 6, but also in Radiator No. 3.

At this time a careful study was made of the pressure heads producing flow and the friction heads resisting flow in the several parts of the system, and especially in comparison with the conditions that exist in an electrical installation in which the heater and the several radiators are replaced by batteries which furnish the pressure heads, and the pipe lines are replaced by wires which furnish friction heads and it was decided to introduce sufficient friction in each radiator connection to balance the pressure head produced by that particular radiator and also the pressure head available at that radiator of the total pressure head produced by the heater—in other words, to design the circuit for every radiator so that the friction head in that circuit is exactly equal to the pressure head for that circuit.

Since this could not be done without using pipes smaller than ¾ inch for the radiator connections, it was decided to use one or more circular orifices, installed in unions in the radiator connections. For this purpose copper sheets, having a thickness of about .025 inch, with openings of respectively ¼ inch, 5/16 inch and ⅜

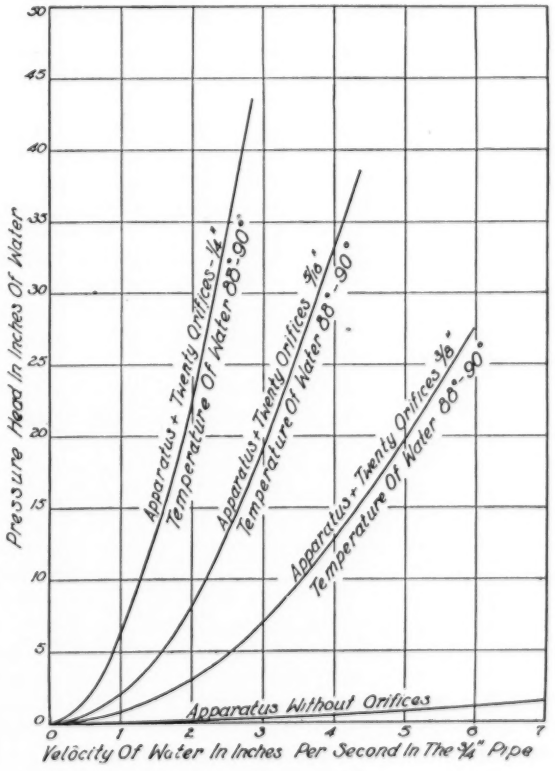

Pressure Head In Inches Of Water
Velocity Of Water In Inches Per Second In The ¾" Pipe
Apparatus + Twenty Orifices ¼" Temperature Of Water 88°-90°
Apparatus + Twenty Orifices 5/16" Temperature Of Water 88°-90°
Apparatus + Twenty Orifices ⅜" Temperature Of Water 88°-90°
Apparatus Without Orifices

Fig. 12.—Warm water friction heads of the apparatus depicted in Fig. 10

inch were secured and the friction heads produced by these orifices in ¾ inch pipes were determined.

To determine the friction head caused by a circular orifice in a thin metal plate placed in a union in a ¾ inch

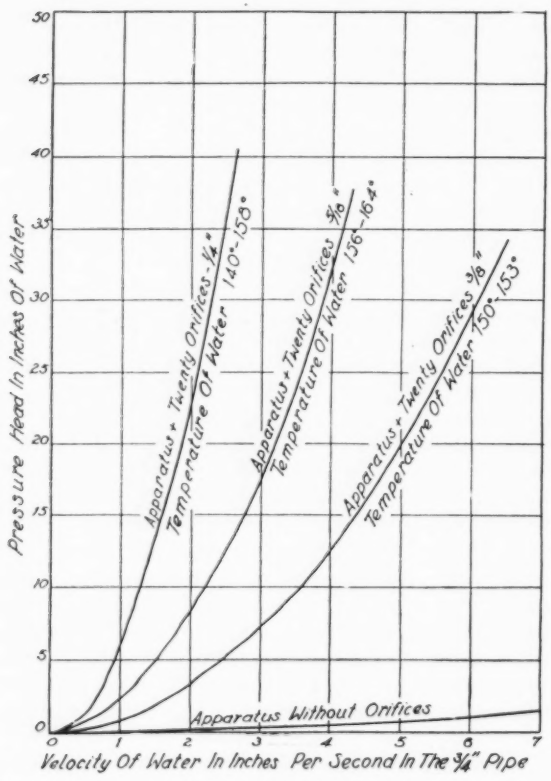

Pressure Head In Inches Of Water
Velocity Of Water In Inches Per Second In The ¾" Pipe
Apparatus + Twenty Orifices - ¼"
Temperature Of Water 140°-158°
Apparatus + Twenty Orifices 5/16"
Temperature Of Water 136°-164°
Apparatus + Twenty Orifices 3/8"
Temperature Of Water 150°-153°
Apparatus Without Orifices

Fig. 13.—Hot water friction heads of the apparatus depicted in Fig. 10

pipe, the apparatus shown in Fig. 10 was constructed in such a way that there were 20 unions separated from each other by 6 inch nipples, the pipe line doubling back on itself so that the two glass manometer tubes were near each other to facilitate the measurement of the difference in elevation, H, of the surface of the water in the two tubes. This difference in elevation, H, is the head lost in the path from A to B. The larger portion of this loss of head is produced by the 20 orifices and the remainder by the pipe line, AB.

To arrive at an approximate value of the loss of head caused by one orifice, let us assume that the water is flowing along the ¾ inch pipe with a velocity of 2 inches per second, and that it is forced to flow through a circular orifice and that, in flowing through the orifice, the stream lines converge, as indicated in Fig. 11, and as is known to be the case when the discharge through the orifice is into the air, in which case, the area of the most contracted portion of the stream is about 62 per cent of that of the area of the orifice. When the stream of water is discharged into a body of water instead of into air it may be checked before its area can contract materially. Assuming that no contraction takes place, the maximum velocities at the three respective orifices will be 21.7, 13.87, and 9.66 inches per second, when the velocity of the water in the ¾ inch pipe is 2 inches per second. The respective heads required to produce these increases in velocity are 604, 240, and 115 mil inches.

Assuming that the energy required to produce these velocity heads is transformed entirely into heat (which in these cases would elevate the temperature of the water less than 1/10,000 degrees Fahr.) these heads of 604, 240, and 115 mil inches, respectively, would be the friction heads added to the radiator circuits by introducing a ¼, 5/16, or ⅜ inch orifice into a ¾ inch line when the water has a velocity of 2 inches per second in the ¾ inch line.

If the above reasoning is correct, the friction heads caused by such orifices will be practically independent of the temperature of the water, because, in these cases, the losses of head are not caused by internal fluid friction, but by transformation of kinetic energy into heat.

The results of the experimental determinations are shown in Figs. 12 and 13. The friction head caused by the pipe line AB (without the 20 orifice plates) is represented by the line near the bottom of the diagram. The friction heads caused by the pipe line AB plus the 20 orifices are shown by the three other lines which represent respectively the ⅜ inch, 5/16 inch, and ¼ inch orifices.

A comparison of these four lines shows that the friction head of the line AB without the orifices is so small when compared with the friction heads of the pipe line with the orifices that it may practically be neglected.

A comparison of the values shown by Fig. 12, which were secured with water having a temperature of 88 to 90 degrees Fahr., with the values shown by Fig. 13, which were secured with water having a temperature of 140 to 164 degrees Fahr., shows that the two sets of values are practically identical and that the friction head caused by an orifice is prac-

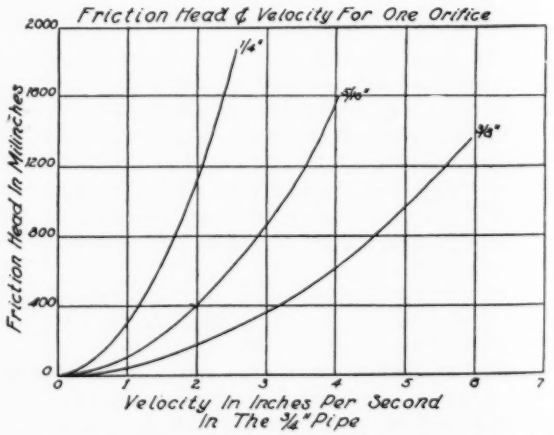


Fig. 14.—Friction heads of orifices placed in ¾ inch unions

tically independent of the temperature of the water, as suggested above.

With the data of Fig. 13 as a basis, the curves of Fig. 14 were perpared for use in the design of hot-water heating systems.

Referring to Fig. 14, it will be seen that the friction heads of a ¼ inch, 5/16 inch, and ⅜ inch orifice, for a velocity of 2 inches per second in the ¾ inch

pipe are, respectively, 1,130,400, and 170 mil inches, or about 88 per cent, 66 per cent, and 46 per cent, respectively, more than those calculated on the assumption that there is no contraction of the stream flowing through the orifice. If these increased friction heads are to be accounted for by a contraction of the stream through the orifice, the respective contrac-

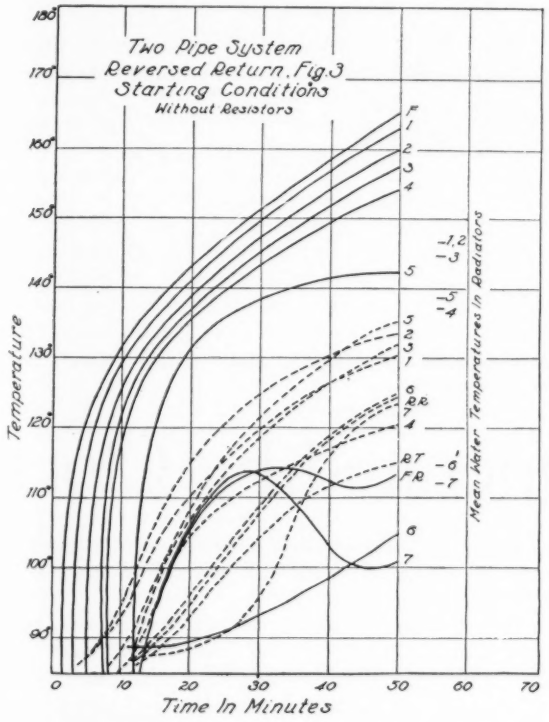


Fig. 15.—Record of starting conditions for the reversed-return system without resistors

tions in area, must be about 73 per cent, 77 per cent, and 82 per cent.

Having determined the friction heads caused by these orifice resistors, it is comparatively easy to determine which resistors and how many must be inserted in any one of the radiator circuits in order that the friction head in that circuit may be equal to the pressure head available for that circuit when the system is operating at the rate for which it was designed.

This was done and a very satisfactory operation of the system was secured. The results of one of the experimental runs are shown in Fig. 16. It is evident, from this graph, that all radiators were operating in the right direction, that the temperature drop through each radiator was about 25 degrees Fahr., and that the water entering Radiator 7 was almost 20 degrees Fahr. cooler than that entering Radiator 1.

This excessive cooling of the water before it reaches the last radiator emphasizes the importance of covering the mains, or at least of covering the flow main.

Comparing the operation of the system as shown by Fig. 15, when the system had been very crudely designed according to approximate rules for pipe sizes, with the operation of the same system as shown by Fig. 16, when the design of the system had been improved by adding enough resistance to the several radiator circuits so that in every case the friction head for the circuit was equal to the pressure head for that circuit, will suggest that for a heating system of the type under discussion it is impossible to prepare a set of tables from which pipe sizes can be selected in such a way that the system will function correctly, without including also a set of tables of resistors to supplement the table of pipe sizes, unless the pipe sizes for the mains are unduly large.

It may be possible to secure a radiator valve which will perform the functions of both the orifice resistor and of the radiator valve.

The calculations relating to the use of orifice resistors, mentioned above, are explained in detail in the discussion of the two-pipe direct-return system.

The second experimental installation was the one-pipe system, shown in Fig. 1. The operation of this system was entirely satisfactory. Fig. 17 shows one of the sets of results secured with the one-pipe system. Fig. 18 shows the results secured with the same system after additional friction heads had been introduced in the several radiator circuits by the addition of orifice resistors to the several risers as tabulated in Fig. 18. The effect of the resistors is to retard the flow of the water through the radiator and thereby to increase the temperature drop through the radiator. For example, in the run recorded in

(Continued on Page 98)

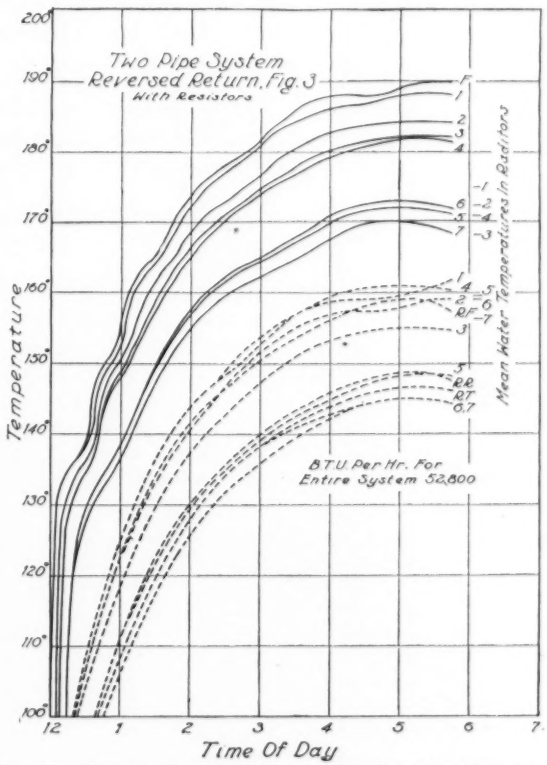


Fig. 16.—Record of a typical run for the reversed-return system when each radiator was supplied with a resistor of the proper size

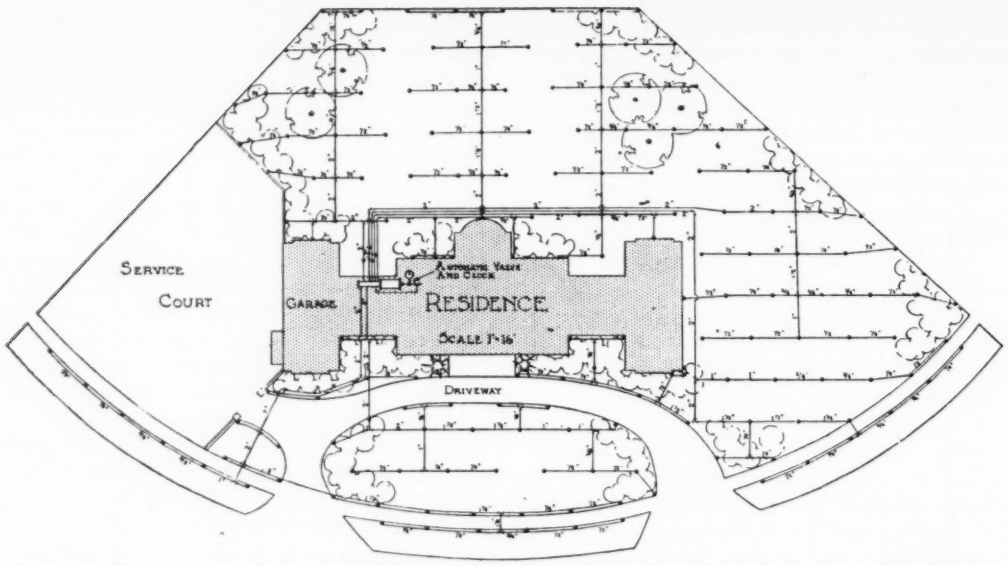


Fig. 1.—A diagram of an elaborate sprinkling system which is made up of typical units. Note the pipe sizes listed on the drawing

Sprinkler System Operated by Clock

THE master plumber is coming into prominence as a rain maker. Parks, golf courses, gardens, lawns, estates, and flower beds which were one time at the mercy of Mother Nature are now kept fresh and beautiful by means of the various types of sprinkling systems that are available. Sprinkling is always a piping proposition and also a plumbing job.

Some of these jobs are of an enormous proportion. A recent one that deserves attention covers more than 300 acres of land, all of which was sprayed by an underground system.

In this article are described some details of an installation in the grounds surrounding a residence in Detroit, Michigan.

An automatic control valve operates different sections of the system, giving a particular time for each section. Flowers that require less moisture are watered three or four minutes while the lawn may require seven or eight minutes at regular intervals. The makers of this system believe that this amount of detail and accuracy in sprinkling or spraying as they prefer to call it is quite necessary for the best results.

System Designed not to Operate if It Rains a Certain Amount

An electric clock turns the system off and on at given times. The spray heads rise automatically when the water is turned on and drop below the surface of the earth when the water is turned off. The system is drained after watering. With this kind of control the night hours may be used for watering and this will continue whether the owner is at home, away from home, asleep or awake. Another automatic feature shuts the system off when there is a certain amount of rainfall. A special attachment may be connected with this system to form a fire fighting unit.

The system of piping is set six inches under ground. The drain valves are underground, and this drainage provides water for the deep rooted shrubbery. It is stated that the sub-irrigation is accomplished through capillary attraction which means that the water percolates through the drain valves toward the surface of the earth while the surface irrigation penetrates the earth from above.

W. J. White of Cincinnati, Ohio, states that selling and installing spraying systems is distinctly a plumber's job, but that if the plumbing trade does not take up this line of work that someone else will do so. In a recent communication, he goes on to explain some of the scientific phases of spraying as follows:—

"Today, the landscapes of our cities include not only grass areas, but flower gardens, shrubbery, etc. The fitting of the right type of garden to a given home plot is now given first consideration with the plans of the house itself. There are so many plants that require special conditions of soil and moisture, that it is neither possible nor a good investment for laymen to even try to plan a landscape that will be correct, especially in the more important details.

"The increased appreciation of what proper maintenance means to the landscape is most encouraging. The growth of interest in exterior adornment has brought about a new order of maintenance in the garden."

The Maintenance of a Landscape Garden

"In order that one may fully appreciate the problem of maintenance from the standpoint of time and

labor with the hose method, it has been conservatively estimated that 70 per cent of the gardener's time is actually taken up with the watering problem. This clearly points out the fact that antiquated methods of supplying moisture for the development and maintenance of plant life represents the greatest daily investment of time and labor.

"The age old problem of preventing summer injury to plants, flowers, lawns, etc., during hot dry spells has been accepted as practically insolvable until recent years. Even the scientist was stumped in procuring a device that would be practical for all landscape purposes until his attention was brought to the system of landscape watering, or, in the specific meaning of the word, irrigation, that has proved to be practical for landscapes of all sizes and description. Through the co-ordinated efforts of the landscape engineer, landscape architect, botanist, chemical and hydraulic engineer, a thoroughly practical system of scientific landscape irrigation is now within the means of every home that can afford to invest money in the area necessary for the garden itself.

"The necessity for such a group of specialists can best be explained by giving a summary of the reasons for scientific irrigation in the first place. England is noted for its gardens of exceptional luxuriance. This is largely due to the presence of water vapor in the air. Students of gardening courses have learned the importance of supplying water to plant roots. Furthermore of bathing leaves in water vapor during hot dry spells. Roots can only feed upon soil water and leaves can only breathe when their internal tissues are moist. Dryness so injures the delicate walls of the breathing chambers connected with the breathing pores of the leaf that many plants cannot be grown in our climate, while all those that do are more or less checked in their development and never reach their full luxuriance.

Vaporized Air Necessary for Plants

"It is not sufficient to simply get water to the roots. Leaves, flowers and tender shoots must be bathed at certain intervals in very moist air. Drops too large to enter the microscopic breath pores to refresh the walls of the breathing chambers should not be used. Visable water drops roll off the waxy outer surface without entering. Unless these walls be kept moist, the breathing is interfered with in the same way that the breathing of a fish is hindered when the surfaces of its gills become dry. Plants need vaporized air in addition to water for the roots, especially during hot dry spells.

Experience has thoroughly demonstrated that the hose methods of watering lawns and gardens does not give the proper amount of water to the plants which must both drink and breathe. It fails to vaporize the air and thus injures the plants in every hot dry spell.

"Science has worked out a practical method of scientific landscape irrigation that enables plants to rise to new levels of beauty and productiveness and at a reasonable cost. This permits not only the watering of roots with precision but it also charges the air above your lawns and around the plantings with the vitally important water vapor. This new

(Continued on Page 107)

Fig. 2.—View of a sprinkler installation located in Chicago. In a fully automatic system, control is such as to prevent its operation in the event that the plants have received a sufficient amount of sprinkling from the rain

CASH JOURNAL — FOR THE MONTH OF January 1929 — FOLIO ...1

GENERAL LEDGER			ACCOUNTS PAYABLE			ACCOUNTS REC'BLE				DESCRIPTION	CASH				OVERHEAD EXP		COM. & JOB: EXP		INCOME	
CHARGES	ACCT NO	CREDITS	CHARGES	✓	CREDITS	CHARGES	✓	CREDITS	DATE	NAME	CHARGES	CK NO	CHECKS	BAL'CE	ACCT NO	CHARGES	ACCT NO	CHARGES	ACCT NO	CREDITS
500 00	10				500 00					Bill for Plant Equip.										
2300 00	14				2300 00					" for Merchandise										
250 00	5				250 00					" for Supplies										
					300 00					Expense bills						300 00				
										Office Salaries			120 00		101	120 00				
										Payroll			400 00				111	400 00		
						1900 00				Bills rendered									200	1900 00
								1200 00		Customers bills paid	1200 00								200	40 00
								40 00		Allowances on bills										
			600 00							Merchandise bills paid			600 00							
			30 00							Discount taken									205	30 00
200 00	3							200 00		Note fr. Customer										
	21	900 00	900 00							Trade acceptances										
																				A.J.P.

Form C

Modern Accounting, *Simplified*

By A. J. PEEL

PART IV—*Payments and Receipts*

IN THE last instalment of this series we discussed the recording of items of expense and purchases of material, equipment, and labor (payroll). These items are entered in an Accounts Payable, (or invoice) register, and represent incurred expense. The *payment* of these items is another matter altogether, and we have not yet taken up this feature.

If you are following through this series of articles, you will remember that I featured two different types of forms which are generally used today; one was strictly an invoice or accounts payable register—that is to say, it was a form used only for bills (and sometimes payrolls), which had been passed for payment, but not yet paid. The other form, which is known as a Cash Journal, was a combination of the Accounts Payable register, the Cash Book, and the General Journal. On this latter form of record I included some payments and receipts of cash, but we did not discuss these for the reason that I wanted to deal with one thing at a time.

Recording Payments

We will now consider the question of recording payments and receipt of cash. Whatever else the master plumber does not have in the way of accounting records, a cash-book is something he can't, under any conditions, do without. It is the oldest form of accounting record, and for many years it was the only form of record. I have even met plumbers in some sections, who still use little more than a cash-book. It need hardly be said, however, that this is a sign of incompetence and a very serious handicap in business.

For the benefit of the reader, the Cash Journal form which was published with the article which appeared in the June 1 issue of DOMESTIC ENGINEERING, is shown again with this article so that we can easily pick up the items which are "cash-book" items, that is, they are either payments of cash, or cash receipts. When we use the word "cash," we interpret this in the broadest way and include checks as well as currency.

If you will refer to this exhibit (Form "C") you will notice two "CASH" columns, one headed "Charges" and the other "Checks." The charge column which is the "Debit" column, is for Cash received, while the check column, is, of course, for cash going out, therefore, a "credit." The entries involved in both the receipt and the payment of cash are very simple. If it is cash which is received or paid, then of course, there must be an entry in the "CASH" column. We know that every transaction in our system requires *two* entries. If we received cash, the next thing to decide is, where did it come from, or, on what account did it come? If it came from a customer, then the customer must be credited. The account which represents what is owed to the plumber by customers, is, as we already know, Accounts Receivable. This being the case, all money received from customers is first of all entered as cash received, and then as a credit to Accounts Receivable. With money that is paid out, the question to ask is, what for? In the case of merchandise bills,

it is always in payment of an account which has been credited to Accounts Payable at the time the bill was received. You will remember, perhaps, that at the time we entered the bills for merchandise received, in the Accounts Payable register, or the Combined Cash Journal (Forms "A," "B," or "C" in the June 1 article) we charged the proper expense account with the cost of the purchase, so we don't have to worry any more as to where to charge merchandise. A payment of a bill which has been previously charged in the Accounts Payable register, is always something which reduces our liability to creditors. And the account which reflects our liability to our creditors is, Accounts Payable. We reduce our accounts payable accounts by debiting them with each payment made on these accounts, thus following strictly the rule of double-entry bookkeeping, which demands a debit for every credit. When we enter the check in payment of the bill, we are crediting the Cash Account, therefore the next entry must be a debit, and this we find in the Accounts Payable debit column.

It doesn't matter in what form we make these entries, the procedure never varies. A payment of cash is always a credit to cash and a debit to Accounts Payable (if the charge has been entered in the Accounts Payable register or credit column, at the time the bill was received); or a debit to some expense account (if no entry was made previously, and the payment of the account in question is the first record which is made in the books).

On the other hand, cash received is always a debit to the Cash Account, and a credit to Accounts Receivable (if in payment of a bill sent to a customer). If cash is received for a sale of plant equipment, or scrap, or anything else that is not a charge to a customer, then we must credit whatever account is affected by the sale. When allowances are made on customers' bills, the amount of the allowance, plus the amount of the payment, equals the amount of the charge, and each of these items is recorded in the Cash Journal, or Cash Book. The same applies to discounts taken when paying for merchandise.

A study of these entries in the specimen forms "C" and "D" will indicate just how these are handled, and will also illustrate the utility of the account numbers.

CASH JOURNAL

RECEIPTS												PAYMENTS							
SUNDRIES CR.		CASH SALES CR.		A/C'S RECEIVABLE CR.		CASH ACCT. DR.		√	DAY OF MON.		CHECK NO.	√	CASH ACCT. CR.		A/C'S PAYABLE DR.		EXPENSE DR.		SUNDRIES DR.	
										Office Salaries			120	00			19 120	00		
										Payroll			400	00			19 400	00		
				1200	00	1200	00		✻	Customers' bills paid										
									✻	Merchandise " "			600	00	600	00				
105 30	00								✻	Discount on bills paid					30	00				
				40	00				✻	Allowances on Customers bills									105 40	00
									✻	These entries are individual items, in actual practice and the names of customers and vendors would be entered in this space instead of "Mdse bills paid" and "Customers bills paid"										

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MONTH OF January 1929 SHEET NO. 1

Form D

The Separate Cash Journal

As explained in the last article, I am offering alternative forms where these are preferred. It has already been stated that the one combined Cash-Journal Accounts Payable, and General Journal form (Form "C") is very handy for the master plumber who prefers one sheet on which to record everything that is a matter for bookkeeping and posting to the ledgers. But there are plenty of contractors who prefer separate records for cash payments and receipts, invoices, and general journal entries. Form "D" is uniform with Forms "A" and "B" shown in Part III, in the issue of June 1. It is part of the all-visible system which was explained in that article. A separate sheet is used for each month, and because of the ingenious method by which these records are secured in a flexible binder, even two years' complete records, including the customers' and vendors' ledgers, can be kept together in a book which is small

enough to carry easily in one hand. This book contains also all the cost records, which are to be discussed in future chapters.

The reader will note that the ruling of Form "D" is different to that of Form "C." But the method of making entries is exactly the same. The reader is referred to Part II for a full and simple explanation of the rule for debiting and crediting, or double-entry. If this is understood no difficulty will be experienced in making entries to any of the columns shown on Form "C" or "D."

As explained in connection with the Invoice Register forms ("A" and "B," Part III) the totals of the columns are posted to corresponding ledger accounts at the end of the month, except where account numbers are shown. Where items chargeable to different account numbers appear, as in the "Expense" and

(Continued on Page 146)

An Accounting Problem which may have troubled you—

When you close your books at the end of the fiscal period, and you have a number of incompleted contracts that you will not be able to complete for some time, how would these contracts show on your financial statements, the Balance Sheet and the Statement of Profit and Loss?
So. St. Paul, Minn. E. K.

A. J. PEEL replies to the question

Your question as to what to do with incompleted contracts, and how to show these in the Balance Sheet and Profit and Loss statement, is a most important one. In the first place we want to be quite clear as to what is implied. I take it that you do not mean Inventory, which includes, of course, Labor and Material in progress; or, *completed work* which has not been billed. This, of course, is a legitimate item for the balance sheet, and would appear under the current asset group as Inventory. It represents the balance of labor and material not charged to contracts or jobbing expense at any given period. All labor and material charged are, of course, reflected under Accounts Receivable, unless paid.

The question now arises, What shall we do with the *unearned* balance of the contract? Theoretically, we have incurred no expense for this, neither in the form of labor nor material. If any expense has been incurred by us for future operations on an unfinished contract, then that will be reflected in the Inventory account in the usual way.

The answer to this problem is, that whatever we may do in regard to including it among our assets in the balance sheet, the *unearned* balance of the contract is *not an accounting item at all.* By that I mean it has no place in our books, and, strictly speaking, we cannot include it in our assets, for the simple reason that we can never be positive that we are going to complete the work. If it is carried on the books—and there is no reason why it shouldn't be—it must be merely as a *memorandum* account. It does not come into the Trial balance, nor does it permanently change the Net Worth figures.

My own opinion in the matter is that it shouldn't be shown at all in the Balance Sheet, but should be the subject of an auxiliary statement. Usually the only purpose in including *unearned* balances as represented by uncompleted contracts is when accommodation is sought from a bank, or when the business is changing hands.

Neither does uncompleted work influence the Profit and Loss account in any way, since profit or loss can be ascertained only on the basis of *cost* and *selling price.* We may have the latter even for uncompleted work, but we certainly haven't the former until cost has been incurred.

To sum up on this point: I would strongly urge that no attempt be made to carry unearned contracts as *accounts.* If there is good reason for showing them as part of the assets of the business, do so in memorandum form.

There is a way of showing them on the books, but it involves quite a little extra bookkeeping. You are probably familiar with this method, and I shall deal with it later in the series; but it amounts to exactly the same thing in the end.

If there are any other points which I have not made clear, please do not hesitate to write me. This is a service which the magazine is glad to give to its subscribers.

Piping Problems *in an* Hawaiian Pineapple Canning Factory

By GEORGE MELLEN

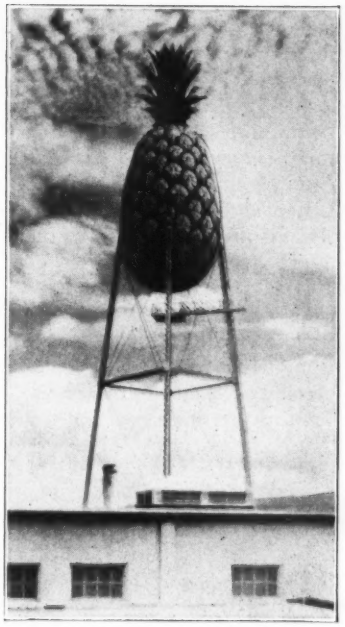


Fig. 1.—A water tower used to advertise the pineapple canning factory which provides storage and pressure for the fire protection sprinkler system

"GO down three feet anywhere under this plant and you will find the Pacific Ocean," said the master mechanic of the Hawaiian Pineapple Company. There you have one of the conditions encountered by the pineapple canneries in Honolulu, the capital, on the Island of Oahu of the Hawaiian Islands.

The proximity of the sea water to the surface may vary with some of the canneries, but in the case of the property of the Hawaiian Pineapple Company, which is in Honolulu and within 3,000 feet of the harbor, salt water is usually no more than three or four feet below the surface of the ground. The formation is principally coral, with perhaps some volcanic lava rock of equal porosity, and the tide penetrates without hindrance. The cannery's answer to this sub-surface salt water has been worked out by the use of pipe which resisted this corrosive action and which is used altogether for the company's water lines and of course for the city water mains which lead to the plant.

Fruit Acids Corrosive

Another plumbing problem with the canneries, and one that is ever present, is the corrosive action of the fruit juice. That sharp acid which makes your tongue tingle is extremely destructive to most metals, and when hot its corrosive action is intensified. The strength of the pineapple juice can be appreciated when it is realized that where it drips on the concrete floor beneath machines or tables, it etches away the concrete until the rock or gravel ingredients stand up an eighth to a quarter of an inch above the cement binder.

The life of some of the first installations of pipe used as a conductor for this raw juice was rarely two years—more often one. As a consequence, pipes used as raw juice conductors are being replaced by special piping as rapidly as they give way.

Many other kinds of pipe are used in the canneries for many other purposes such as for vacuum lines, high and low pressure air, water, steam and oil, and they are of every kind of material of which pipe is made. It would take a master metallurgist, aided by a well-informed guide, to identify the different pipes in the miles of various-sized lines that run overhead. For the two-inch syrup lines carrying the neutralized juice into the cans immediately before sealing, one kind of pipe is used. For certain other purposes, another kind of pipe has shown up well. Where installations are permanent and tearing out would be costly, as in concrete floors, still another kind of pipe is used.

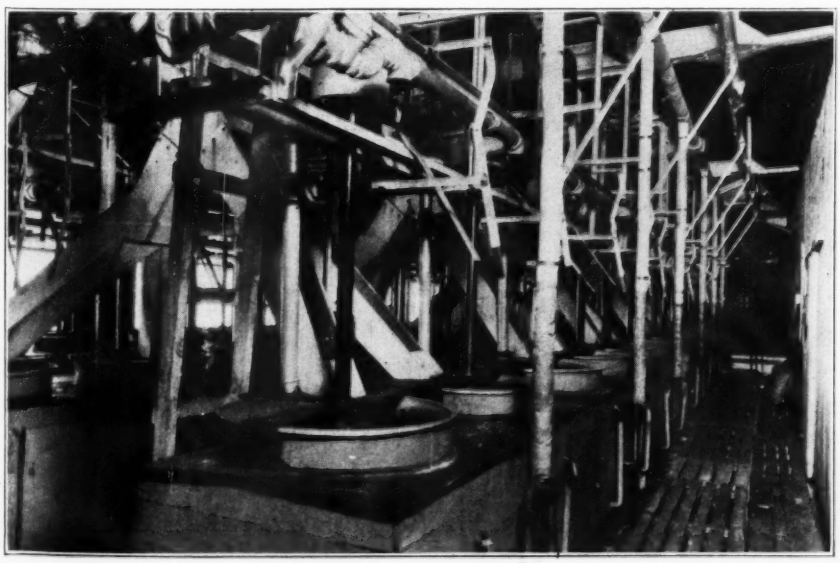


Fig. 2.—Some idea of the extensive use of pipe in this industry is gained from this view. This, together with the corrosive action of the fruit acids and salt water indicates some of the problems encountered in plumbing

Sewage

Another problem had to be handled—sewage. The plant is at a lower level than the city sewer mains, and is too large to use a private cesspool. It was necessary to install special pumps and

a 4-inch pressure line and elevate the sewage to the municipal mains, through which it is carried by gravity to the sea.

A septic tank about 10 feet by 18 feet by 14 feet, containing two motor-driven centrifugal sewage pumps operating automatically by float control, takes care of the sewage from the new four-story warehouse and office building. A similar tank handles the disposal from the cannery buildings.

Water Supply

In respect to water supply, the plant is entirely independent. Auxiliary to the Honolulu city water it has four artesian wells of its own, with a daily capacity of around 6,000,000 gallons. The water from this source is used exclusively during the peak of the season when the plant is running at capacity; the city supply at these times is shut off at the mains. Even at other times the city's water is used only for domestic purposes, that is for washrooms, showers, drinking fountains and other ordinary demands.

Plumbing installations for these needs in the huge plant include approximately 105 toilets, 140 wash basins and 42 showers, with hot water at all times. The large washrooms for the cannery workers are generously fitted in the most modern manner, clean, well-lighted and well-aired.

The Pineapple Water Tank

Three electrically-driven centrifugal pumps, directly connected to 12-inch and 14-inch pipes, deliver water throughout the plant and to a 100,000 gravity storage tank over the warehouse, designed in the form of a gigantic pineapple, which creates the pressure for the automatic sprinkler system that protects the whole plant.

This novel water tank was built by a Chicago iron works concern. The tips of the topmost leaves are 199 ft. above the ground. The leaves are of ¼-inch steel and the longest measure 18 ft. The job of painting the tank was done after the work was erected and was one of the most daring and hazardous pieces of work of this sort that has been done in Honolulu. The leaves are painted green and the lower part the natural color of the fruit. The total effect is a most realistic appearance of a great pineapple and is one of the first things the approaching traveler sees as he enters the harbor of Honolulu.

Costing $168,000 and protecting approximately 835,000 sq. ft. of floor area, this fire prevention system provides complete protection for the plant. Some 13,000 sprinkler heads were used in the installation. The Hawaiian Pineapple Company was the first concern of any kind in the Islands to use this type of fire protection, and, incidentally, its fire insurance rate is the lowest in Hawaii.

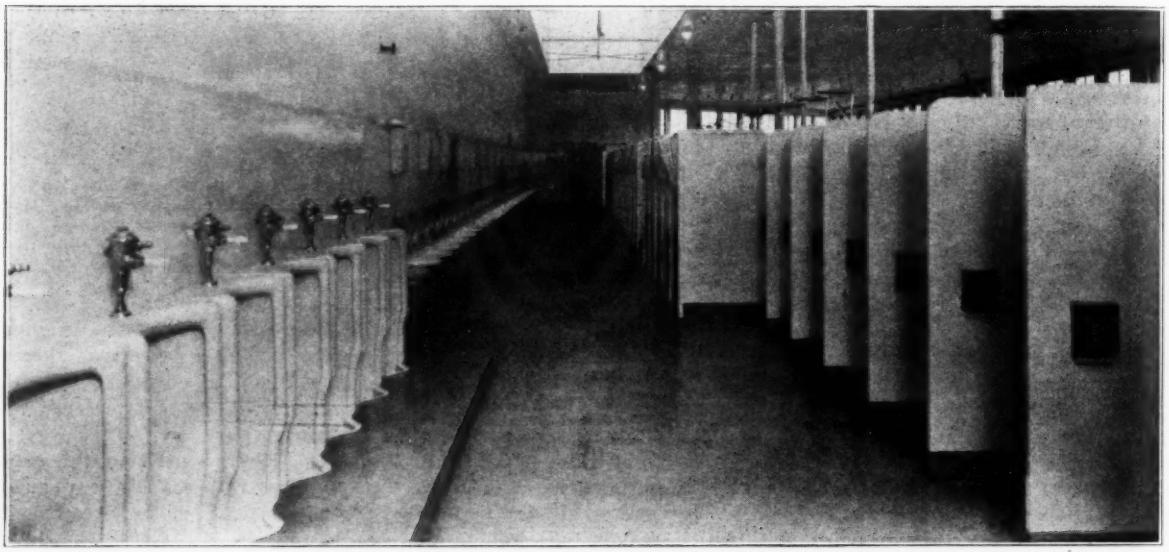


Fig. 3.—The city water supply is used only for purposes of operating fixtures such as shown in this view. When the plant is running at capacity, the city water is shut off at the mains and the water supply is taken from the private wells of the company

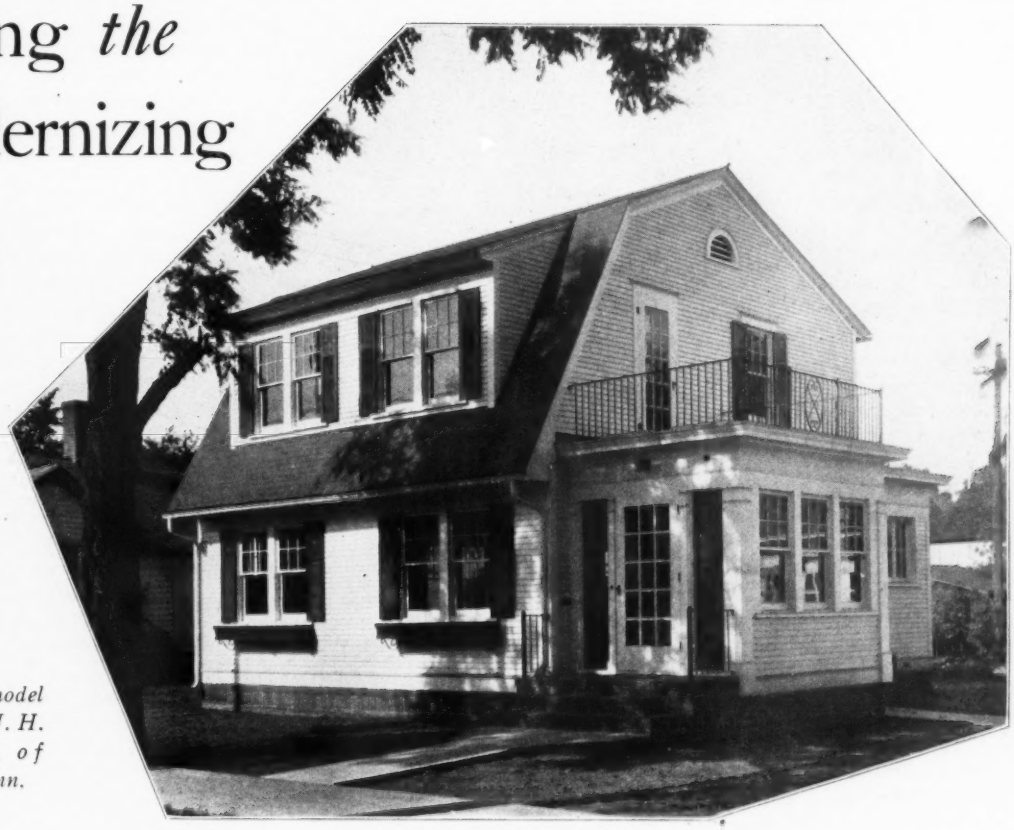
It is of interest here to add the explanation of an official that while this system guards against property damage, and results in a very low premium, the primary purpose in installing it was for protection of the company's market—a world-wide demand for its product built up at much expense and over a long period of time. Temporary inability to supply this market through the damage to machinery or plant would result in a loss beside which the property loss would be considered insignificant.

A centrifugal pump capable of a pressure of 100 pounds at 1,000 gallons per minute is always ready for action. In addition, the company's sprinkler mains are interconnected with the storage tank of the American Can Company whose plant adjoins, thus giving an added reserve supply. By this mutual agreement the American Can Company's plant is likewise given increased protection.

(Continued on Page 146)

PLUMBING & HEATING MERCHANDISING

Selling *the* Modernizing Idea



This is the model home built by J. H. Thompson, of Winona, Minn.

By *Direct Mail Advertising; Newspaper Advertising; An Effective Repair Truck; Store Displays;* and by *Actual Home Demonstration*

A MERCHANDISING program leading up to and culminating in an actual demonstration of what the modern home ought to have in the way of plumbing and heating equipment is part of the selling record of J. H. Thompson, whose company is the American Plumbing Company of Winona, Minn. Mr. Thompson is one of that large number of plumbing contractors who have not been handicapped (as so many people seem to think a man is handicapped for selling) by a career as a mechanic before entering into business for himself. In every particular, his experience as a business man shows a consciousness of the requirements of good retailing. We do not feel that any comment will add to the value of his story as it is told below in his own words.

"Previous to getting established as a stranger in a strange town I had been employed as a journeyman for six years in Toledo, O., and then fourteen years in Superior, Wis. At present, while I am operating what would be called a small business, it is with a little satisfaction that I can look back at my first year's experience in getting launched in the selling end of this great industry.

"I had an initial investment of $135, plus my own kit of tools; $30 of this amount went to pay the first

month's rent for the store in which I am at present located. During the first twelve months this investment netted a profit or salary amounting to more than I had ever acquired during any previous like period as a journeyman.

"During that first year I found I had directed most of my efforts toward strictly trying to merchandise plumbing and heating, by selling to the small unimproved homes. Taking advantage of manufacturers' literature, using a small amount of local newspaper advertising as a tie-up with national advertising, and by making a mailing list of prospects which were followed up with personal calls brought me twenty sales of heater installations and a total volume of plumbing and heating sales for the year amounting to $15,000. So much for the start.

"Very little of my time was given to competitive contracting. My volume the second year increased twenty-five per cent. Then at the end of that year I received and accepted a position with a manufacturer of heating goods to act in the capacity of promotion salesman. This position was held for two years and during that period I had the privilege of continuing the operation of my business here at home, which, of course, I was only able to do by employing the assistance of a partner to take care of it during my absence.

"In July, 1927 I again took over active operation. During the first part of 1928 'the repair truck' was put into service. From the standpoint of advertising value this truck has more than earned its original cost.

"I might mention that the most outstanding feature of this truck is the four-compartment window display. This display can be changed from time to time, using various window display posters or any new materials in the plumbing and heating line. You will, no doubt, readily see that it is distinctly a truck belonging to the plumbing business and not likely to be mistaken for a dry cleaner, department store or any other kind of a delivery truck. I believe that it has proved to be very suggestive in calling the public's attention to plumbing requirements.

"It has also occurred to me that advertising is nothing more than calling people's attention to something they might need. The more this something is displayed and brought to the public's eye, the more easily it is for the buyer to remember to provide himself with that particular item of merchandise.

"I should like to bring out the fact that if every plumbing dealer in all sections of the country were to have a truck of a standardized form with a window display or something similar nothing could prove a greater aid to the increase of plumbing sales.

"The truck has been of great value in advertising; in fact I believe more so than newspaper advertising. In my way of expressing it, I should call it a moving billboard. During the past year I have cut my newspaper advertising 50 per cent and my records show that the repair work has

The news story about the model home

Compactness, Modernity in Model Home

The laundry, fuel room, vegetable cellar and all of the plumbing equipment have been placed in one portion of the basement and more than a full half remains to be used as a children's playroom.

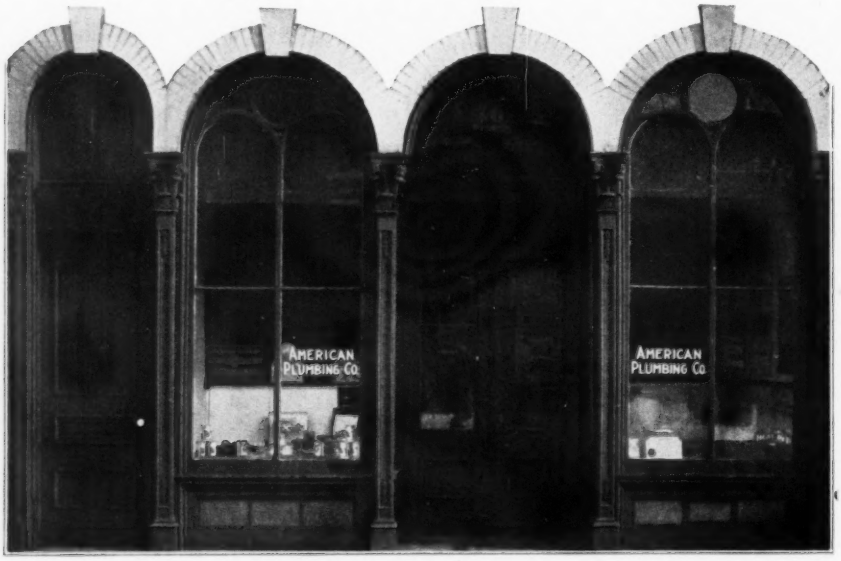
Included in the equipment is an automatic water softener and a coal fired hot water heater which is also automatically controlled to hold the water at even temperature through the use of a thermostat. The laundry consists of a two compartment stationary tub and will be equipped with an electric washing machine.

A water tube boiler of the latest design to provide hot water radiator heat has been installed. The boiler is covered with a metallic enameled jacket and thoroughly insulated. The boiler is coal fired and equipped with an automatic pressure regulating system which insures a more efficient circulation of water. There is also a thermostatic equipment to regulate the house temperature.

The radiators are of the Corto type and are of high and low design, according to the use to which they are put. There is a lavatory in one corner of the kitchen.

The bathroom is only five feet wide and seven feet long, although it contains all bathroom equipment of the latest design. There is a tiled-in bathtub equipped with taps for both city and soft water. There is also a shower-bath attachment with a silk waterproof curtain. The toilet is of the silent action kind and not attached to the wall as are those of earlier design. A pedestal lavatory has been installed with concealed water supplies. The soap dishes and towel hooks are tiled in.

A compact clothes chute and a built-in medicine cabinet with a mirrored door are other conveniences.



A Plumbing Shop on Wheels!

Completely Equipped and Coming Right to Your Door

THE old story of the plumber who always had to walk back to the shop for tools and materials has been made obsolete by this newest addition to the service and equipment of the American Plumbing Co.

We have placed in operation a handsome new truck shown above, which will go out on all repair calls. It will carry every tool needed for any kind of work, including an electric power pipe cutting machine, and more than 2,000 different items of material and repair parts.

This will mean to Winona home-owners a tremendous saving in costs of repair work, as well as quicker service on every job.

There will be no additional charge for this extra service. Our recompense for the large investment required is the greater volume of business which we expect to do through these additional resources, and the satisfaction of good work well done, at a distinct saving in cost to the customer.

Courtesy, care, cleanliness and skilled workmen are characteristic of all plumbing and heating jobs done "the American way." A telephone call to 534 will bring this complete plumbing shop to your door.

Steadily Growing Since 1921

AMERICAN PLUMBING CO.

How Mr. Thompson merchandised his portable plumbing shop

increased 100 per cent since placing this truck in operation, which is a little more than a year ago. There have been many occasions when the truck has been called on a repair job that a neighbor or maybe two in the same block would call on the plumber in charge of the truck to have their plumbing needs taken care of. Likewise, the cost of operating this truck has been cut to the minimum simply because it is not necessary to have a separate driver.

"You will note from the newspaper ads (reproduced in this section) a description that I have used in advertising and you can gather somewhat of an idea as to how the interior of this truck is equipped. There are thirty-seven small fitting bins which have been found to be sufficient to carry enough pipe fittings for the average emergency repair job. These bins do not occupy any floor space; on the side above the display compartment is a shelf for heavier plumbing goods; directly below the compartments are drawers used for carrying a general assortment of lighter materials; below this is a floor space which is used for caulking lead, oakum, tools and etc.; in back of the driver's seat are hung sewer rods. There has been no floor space sacrificed in this truck and there is no difficulty in carrying all the necessary materials and plumbing fixtures that are usually required for small house jobs all in one load. This has proved a distinct advantage in keeping the truck busy at all times.

"In 1927 I built the new model home which also proved to be the most valuable kind of advertising. Not only did it bring increased sales in my business, but I believe likewise to the plumbing and heating

trade in general. Two complete plumbing installations and one heating system were obtained from visitors during the opening days. Also a number of replacement jobs were obtained which could be accounted for from the registration book in which most of the visitors gave their addresses. This list of addresses also proved valuable in making up a good mailing list of future home owners. A total of 3,300 persons visited the home.

"The wonderful publicity obtained was gotten without practically any expense on my part as all those who took part in the display of the home were very willing to co-operate at their own expense. The electric light company furnished all the electrical current free along with the latest in electrical appliances. They also supplied flood lights in the basement to prominently display the hot water heating boiler, the domestic water heater, water softener and laundry trays. The furniture company equipped the home with the latest in home furnishings; they also furnished additional guides to assist in taking care of the visitors. While all those interested in the building of the home were permitted to participate in the display this kept my advertising cost down to a very small amount. There were several thousand pieces of advertising literature from plumbing and heating manufacturers, distributed."

Above: Interior of Mr. Thompson's store. Below, one of his ads built around the Bath A Day idea

We reproduce in this section one of the news stories which the papers carried. A section of one of the papers was given over to the advertisements and news stories concerning the model home. Here the member of the plumbing industry had taken the lead in establishing the project. It is interesting to note in some of the advertisements of those who co-operated special references to the plumbing equipment in the model home. Mr. Thompson's own advertisement in the section invited close inspection of the "perfect heating and sanitary plumbing installation" and listed by name the various pieces of equipment. As a project conceived and planned by a member of our industry, its practical results recommend it to the attention of others who wish to do something special in the way of merchandising.

Monkey Glands

VIM means vigor, spirit, force. That's what vim means. All people want it, and, once they've got it, they try to keep it. For vim, rightly used, leads to success, and success, also rightly used, leads to prosperity and happiness.

The demand for vim produced the monkey gland idea. Monkey glands may or may not restore vim to a person who has frittered it away. That is still an unsettled question.

But a settled question—a question that has been proved a thousand times—is this: A bath a day helps anybody, old or young, to keep a tight grip on vim.

The daily bath is the greatest tonic ever invented. It tones the entire body—skin, organs, nerves. And to tone is to stimulate life, vigor, vim. When a man weakens he is out of tune—lacks tone.

So, then, forget about monkey glands and think of your bathroom.

A first class bathroom, with everything in it that should be in it, is worth a whole treeful of monkeys. And a bath a day is worth a dozen monkey glands, and at a fraction of the cost.

A BATH A DAY KEEPS YOU FIT EVERY WAY

American Plumbing Company
76 W. 2nd St.

Selective Selling

By MALL

IN 1876 a young man named John Gessler obtained a master plumber's card and started in business for himself. He worked hard, built up a fine business, and was known as an expert and dependable mechanic. His methods were as good as any used in those days. The idea of a combination of merchandising and plumbing had not yet come into existence; or at least had not had much encouragement.

In 1912 John Gessler retired and turned the rather lucrative business over to his son, Joseph. The younger Gessler, having been trained under his father, was accustomed to nothing except what the father had practiced, and as a result fell into the grooves laid out for him. Merchandising was unknown or at least unpracticed by his father, so of course the younger man did not attempt it. He merely carried on the trade created by his father. This was satisfactory because it earned him

a fair income, and the business moved along at the old rate until the Great War came. Then Joseph Gessler closed his shop, enlisted, and went to France, where he stayed for fourteen months.

On his return he found it necessary to go back to the plumbing business, but conditions had changed. Many customers had moved from the old neighborhood, others had entirely disappeared, and of course some had become accustomed to other plumbers. This left him practically one recourse, and that was to start again and build up a new business.

How It Started

The results of his labors are plainly to be seen, because Mr. Gessler has today one of the finest remodeling businesses in the city. He attributes his success to merchandising by direct advertising; this method having been practically forced upon him by circumstances, for when he attempted to round up his old customers he did so by means of writing directly. The results brought in were a big surprise, and he naturally sought other fields in which to continue his experiment. He is today an exponent of merchandising and advertising, and points with pride to his accomplishments.

"Unless," he says, "the plumber of today takes it upon himself to convert to or start his business by the modern ideas of selling and reaching the consumer by some direct appeal, he is doomed to be nothing more than a tinker, fixing tanks or repairing faucets. No successful plumber in the remodeling business has ever reached his position without adopting, in one form or another, modern methods of displaying, selling and advertising."

Mr. Gessler has a mailing list of about a thousand names taken from the telephone book and the tax department records. He confines his list to an area not too remote from his place of business, and verifies every name to be sure that the owner is being solicited and not the tenant. These people are regularly reminded by letters, and no mail leaves the office unless it contains some literature or pamphlets describing some accessory or plumbing fixture and sealed with a "Bath-a-Day" sticker.

Results from One Letter

One brief letter sent out on a circular picturing white toilet seats brought sales for these seats to the number of sixty-three in one week; more such seats, Mr. Gessler stated, than he had sold in any five years since he started in business. He could have sold more, but the unexpected demand found him unprepared for the occasion.

"Direct advertising," said he, "has opened to me an undreamed of field to grow in, and although there was a time when I thought such methods foolish, and the work of the 'unethical' and irresponsible, I now see it as the only path that leads to a succesful business."

Mr. Gessler is an exponent of direct advertising. He considers newspaper advertising too expensive for the average storekeeper, and too slow in its results. This, naturally, applies to a city of the size of Baltimore where newspaper rates are high and where readers are scattered over a large area. The most important source of his mailing list is the tax records. He will first compile a list of the streets that he desires to circularize and then secure the owners' names from the tax records, so that they can be arranged according to the assessment value. The purpose of this is to be sure that appropriate appeals are made, and that accessories or fixtures are described which are in conformity with the possible requirements of the financial position of the owner of the property. Every article de-

A Bath a Day

A BATH A DAY KEEPS YOU FIT EVERY WAY

FOR six hundred years the Romans used no medicine but the bath. Is that strange? It shouldn't be. The secret is very simple. You see the Romans bathed daily, and people who take a bath a day rarely, if ever, need medicine.

A bath a day keeps the pores of the skin open. This makes it easy for the skin to breathe. Skin breathing sanitates the body.

Then, too, a bath a day stimulates—exercises—lubricates, you might say—all your internal organs. This stimulation keeps them working as they should.

When the organs are working properly, they are healthy. Healthy organs make a healthy body. And a body that is healthy does not need medicine.

But that isn't all. A healthy body is a builder of beauty, energy, efficiency and happiness.

If you would know the joy of health and beauty start the bath a day habit. And there is no better time to start than in this month of August.

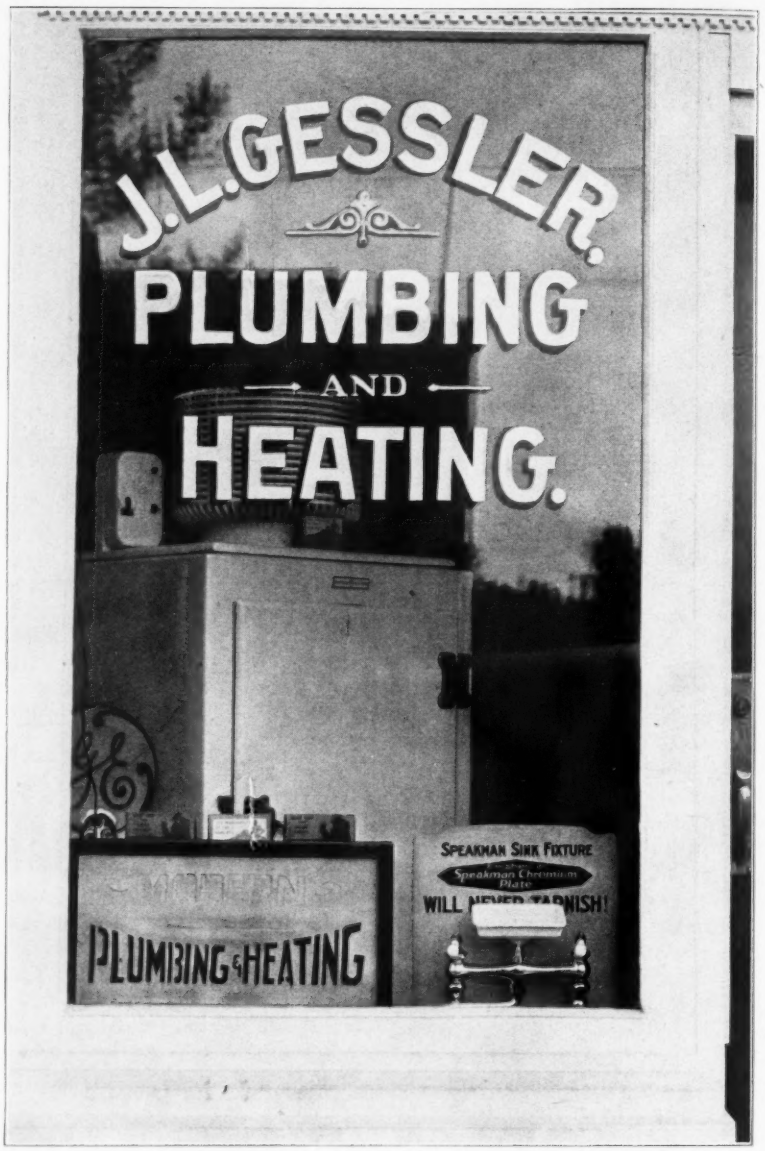
All you need to make the start is a little will power and a good bathroom. You supply the one and we will supply the other. Start a bath a day today, keep it up, and the money you have been paying for medicine will pay for a bathroom several times over.

AMERICAN PLUMBING CO.

J. HARVEY THOMPSON

76 West Second Street **Phone 534**

Another Bath A Day ad



Looking into the window of the Gessler store in Baltimore

scribed in a sales letter is on display in the show-room, and Mr. Gessler believes this is a very vital factor in bringing about a successful campaign.

Backing the Advertising

"If a prospective purchaser," he says, "reads in a letter about some article that he or she would like to have, and comes to the show-room to find that it is not on display, such a purchaser will lose faith in the advertiser, and subsequent appeals by mail will have practically no effect upon him. The seriousness of this cannot be too greatly stressed. 'Don't advertise it unless you have it in stock' is a motto every advertiser should adhere to."

Since people moving into the neighborhood are usually on the market for some plumbing, due mainly to the fact that unsightly fixtures are noticed at once by persons seeing them for the first time, Mr. Gessler is ever alert for this class of business, and finds that the best source of such information is the policeman on the post. By cultivating the friendship of this gentleman, a whole lot of valuable information along these lines can be obtained.

A plumber's business should not stop after a sale or an installation is made, he claims, but another important element must follow, and that is service. Everything sold or installed is guaranteed and serviced to the extent that should any defect of material or workmanship develop it will be replaced or corrected without question or cost to the owner. This promise has always been faithfully kept, and it is considered by Mr. Gessler as one of the main supports of his business.

"Good service," says Mr. Gessler, "is nothing more than taking an interest in your customer's welfare, and can never be overdone."

So essential does he consider the rendering of service that whenever it is possible a personal inspection is made on every call, and all advertising contains his home telephone number for night calls. Every employee is subject to calls on emergencies, and no matter if it be day or night, small as well as large jobs are given the same quick and ready attention.

Training the Mechanics

A great deal of attention is given to the proper instruction of employees in regard to their attitude towards the customer. Since their contact with the customer is for a much longer time than that of the contractor, it is of some concern that they be properly trained so that nothing but a good impression is left behind. Courtesy and cleanliness in all operations within and without the house are demanded, and all objections, suggestions, and other questions by the customer that may arise must be referred directly to Mr. Gessler. This is mainly done for the purpose of preventing so many controversies over "promises" on the part of the employees which are unknown to the employer, and which are the causes, in many instances, of much unpleasantness and dissatisfied customers. Mr. Gessler also makes specific mention in his contracts that "contracts made with our mechanic are not recognized."

Among the many differences that may arise between customer and contractor, the question of the amount of time for labor charged for invariably is the point of the

greatest argument; and here Mr. Gessler again pays strict attention to be sure that charges are correct according to his records. To insure this, a slip upon which a complete record must be made of every job is kept by the mechanic and handed in by him when the job is completed. This record contains the customer's name, the names of the mechanics and helpers, the amount of time on the job by each, when the job was started, when finished, and a list of all materials used. This whole record is signed by the mechanic when the job is finished. At a glance it can be seen by comparing materials used and time consumed a check of the charge is secured.

In addition to this, a weekly time record is kept by the employee, showing the time spent by him on every job for the week. When the salary is paid he signs this weekly memorandum and a permanent record is obtained.

"Faithfulness of workmen," he remarked, "is a great contribution to success, and everything must be done to encourage such an attitude on their part. If they make a sale at any time, or successfully solicit a job, a reasonable commission is paid, so that they are made to feel that they are increasing their earning power as well as providing steady employment. Good wages are paid, and no impositions made or unfair orders issued. Every man is treated as if the success of the organization depended solely upon his loyalty." Mr. Gessler points with pride to the fact that his workmen have remained with him for many years.

Time Payment Selling

The lack of financing, Mr. Gessler believes, is one of the main reasons for the plumbing industry lagging behind other businesses. The real obstacle, he thinks, is the lack of encouragement by the older members of the trade, and the entire lack of educating the public to the fact that the greatest comforts, conveniences, and health safeguards of mankind can be purchased as easily as the most expensive luxury.

To advertise that a shop will finance purchases is essential, he goes on to say. "The leading industries of this country have reached such heights by nothing more than making their products easily obtainable by a series of partial payments."

In relation to financing, Mr. Gessler pursues a course whereby every customer is told that for an additional charge the cost of the plumbing can be divided up into a number of monthly payments extending over a period of time. This proposition overcomes the objection that "I haven't the money to spend for that now," and gives the contractor an opportunity to make a much larger sale. Finance companies that have been organized within recent years will purchase these notes from the contractor and entirely relieve him from any financial responsibility. This system of selling makes the installation of plumbing in the poorest homes easily purchasable, and if the trade as a whole, Mr. Gessler goes on to say, would unite in an effort to make this means of buying plumbing universally known it would open a rich field that has long lain dormant.

A view taken some time ago of the Gessler store

Competing on a Quality Basis

"There are two ways to compete," Mr. Gessler says, "one by quality and the other by price; and if a contractor will give to the customer a quality bid, showing comparison with the merchandise offered by other competitors, he should stand a good chance to win." This philosophy Mr. Gessler follows by adopting certain rules when bidding upon a job. If he is aware that his customer has sought a price bid, he knows that to compete in price and get the job is impossible, so he falls back on the alternative and offers quality. Of course his price may be considerably higher, but when delivering the estimate he explains each piece of material to be used, the guarantee of the manufacturer, the probable life of first class pipe, first class fixtures, and his own responsibility and service as an established business man.

"Now," he concludes by saying, "this is my estimate on good guaranteed merchandise, and the lowest price possible that is consistent with good workmanship. There are many inferior articles that could be used here for less money, but which I neither recommend nor install because of the great risk to my reputation, to the customers' health and convenience."

This argument has won him many jobs in the face of much lower figures, where by explaining the various parts and showing the superior quality of what he offers, he convinces the customer. One satisfied customer will soon spread the news in the neighborhood, and at the same time inform them that "he does not do cheap work," consequently both customer and contractor are prepared to deal upon terms of quality and reasonableness of price and not on the basis of a price bid alone.

How the modern salesroom is familiarizing the public with modern plumbing fixtures

FOR a number of months DOMESTIC ENGINEERING *has been running a series of pictures of new and model salesrooms opened to the public recently by plumbing and heating contractors. When other factors permit the setting up of a salesroom, there is no doubt about its efficiency as a merchandising aid. The three photographs reproduced on this page show the salesroom completed this year by Montrief & Montrief, of Ft. Worth, Texas. Such a showing of modern fixtures, in white and in color, with the accessories proper to beautiful plumbing ware, will be, along with the many other salesrooms in the industry, intensifying the impression the public is gaining of the beauty and convenience of modern plumbing fixtures.*

With this article we undertake a big task and an important one. Plumbing code information can be secured only by a study of the hundreds of codes now in effect—work which can hardly be undertaken by busy men, trying to serve their industry while managing a business of their own. For the convenience of those who may be interested, we shall carry during the coming months a series of

Plumbing Code Tabulations

By R. M. STARBUCK, JR.

THERE is a vast amount of information stowed away in plumbing codes. Some of it is good and some bad, much of it is orthodox and much is radical. However, if some arrangement were made which would allow this information to be made available for use and for comparison, we believe great educational benefit would be derived.

These codes contain much practical information concerning the use of materials, and it is our idea that besides having educational value, such tabulations would also have a considerable commercial value.

We have available for tabulation just about an even four hundred plumbing codes of cities and towns, and in addition a considerable number of state plumbing codes.

Of course, there are codes and codes. Some of them are filled with information, and others are crude and of small value.

We shall take up one subject after another, and doubtless the whole program will cover several months. At the completion of the work, we believe we shall have a collection of tabular information that should be of very great value to many different interests and for many different purposes.

As our first step, we are going to give you a list of the cities and towns that make up our collection, together with the year in which the code was enacted or last revised. This latter information for various reasons may not be entirely reliable, but is as correct as we are able to present it at this time. Quite a few codes have nothing to show the year of adoption, and in those cases no date is attempted. We give the list in full, as follows:

List of Municipal Plumbing Codes

Alabama
Birmingham, 1925
Gadsden, 1911
Huntsville
Mobile, 1929

Arizona
Flagstaff, 1920
Phoenix, 1920

Arkansas
Fort Smith
Hope
Hot Springs, 1922
Little Rock, 1928

California
Alameda, 1913
Alhambra, 1927
Anaheim, 1920
Bakersfield, 1923
Berkeley, 1921
Eureka, 1924
Fresno
Fullerton, 1921
Glendale, 1924
Long Beach, 1920
Los Angeles, 1925
Merced, 1922
Monrovia, 1925
National City, 1920
Oakland, 1928
Orange, 1911
Palo Alto, 1925
Pasadena, 1928
Redwood City, 1922
Riverside, 1923
Sacramento, 1923
San Bernardino, 1928
San Diego, 1922
San Francisco, 1922
San Jose, 1926
San Mateo, 1922
Santa Ana, 1927
Santa Barbara, 1926
Santa Monica, 1928
Santa Rosa, 1914
Stockton, 1926
Ventura, 1924
Watsonville, 1926

Colorado
Canon City, 1909
Colorado Springs, 1919
Denver, 1926
Fort Collins, 1928
Trinidad, 1909

Connecticut
Bridgeport, 1923
Derby
Hartford, 1921
Meriden, 1921
New Britain, 1927
New Haven
New London, 1925
Norwalk, 1922
Stamford, 1926
Torrington, 1921
Waterbury

Delaware
Wilmington, 1927

Dist. of Columbia
Washington, 1927

Florida
Bartow, 1923
Daytona, 1924
Jacksonville, 1924
Miami, 1928
Miami Beach, 1926
Okeechobee, 1926
Palm Beach, 1921
Pensacola, 1909
St. Petersburg, 1926
Tampa, 1927

Georgia
Albany, 1926
Atlanta, 1926
Augusta, 1928
Columbus, 1913
Valdosta, 1928

Idaho
Boise City
Caldwell, 1925

Illinois
Bloomington, 1918
Canton
Champaign, 1922
Chicago, 1924
Danville, 1920
East St. Louis
Elgin, 1924
Elmhurst, 1925
Forest Park, 1927
Harvey, 1926
Jacksonville, 1925
Joliet, 1921
Kewanee, 1920
Libertyville, 1926
Moline, 1925
Peoria, 1926
Rockford, 1927
Springfield, 1921
West Frankford, 1924

Indiana
Evansville, 1927
Fort Wayne, 1927
Indianapolis, 1926
South Bend, 1923

Iowa
Burlington, 1919
Cedar Falls, 1927
Cedar Rapids, 1926
Council Bluffs, 1920
Davenport, 1925
Des Moines, 1926
Fort Dodge, 1919
Keokuk, 1923
Mason City, 1920
Waterloo, 1920

Kansas
Arkansas City, 1927
Coffeyville, 1910
Kansas City, 1917
Manhattan, 1921
Newton, 1913
Parsons, 1903
Pittsburg, 1920
Salina, 1924
Wichita, 1917

Kentucky
Fort Thomas, 1922
Louisville, 1924
Paducah, 1927

Louisiana
New Orleans, 1926
Shreveport, 1921

Maine
Biddeford
Lewiston, 1921
Portland, 1893

Maryland
Baltimore, 1924
Cumberland
Hagerstown, 1922

Massachusetts
Barnstable, 1925
Belmont, 1915
Brookline, 1924
Concord, 1928
Everett
Falmouth, 1925
Framingham, 1909
Haverhill, 1919
Holyoke, 1927
Lowell, 1927
Lynn, 1922
Newton, 1922
New Bedford, 1925
Pittsfield, 1925
Quincy, 1923
Revere, 1923
Salem, 1919
Saugus, 1925
Springfield, 1928
Swampscott, 1921
Waltham, 1924
Woburn
Woods Hole, 1925
Worcester, 1927

Michigan
Battle Creek, 1927
Bay City, 1919

Birmingham, 1926
Coldwater, 1925
Detroit, 1928
Flint, 1901
Grand Rapids, 1928
Ironwood, 1922
Jackson, 1927
Kalamazoo, 1927
Lansing, 1922
Owosso, 1915
Pontiac, 1920
Royal Oak, 1924
Saginaw

Minnesota
Duluth, 1921
Hibbing, 1922
Minneapolis, 1924
Northfield, 1925
St. Paul
Virginia, 1908

Missouri
Bowling Green, 1928
Kansas City, 1910
St. Joseph, 1925
St. Louis, 1928
Sedalia, 1920

Montana
Billings, 1921
Butte, 1920
Great Falls, 1917

Nebraska
Holdrege, 1920
Lincoln, 1924
Omaha, 1923

New Hampshire
Concord
Laconia, 1913
Manchester, 1923

New Mexico
Albuquerque, 1922

New Jersey
Asbury Park, 1925
Atlantic City, 1924
Bayonne, 1901
Belmar, 1904
Bloomfield, 1927
Bound Brook, 1926
Bridgeton, 1920
Burlington, 1908
Camden, 1927
Carteret
Clifton, 1922
Collingswood
Crawford, 1921
Dunellen, 1925
East Orange, 1925
East Rutherford, 1923
Elizabeth, 1926
Fanwood, 1927
Hoboken, 1899
Irvington, 1927
Kearney, 1908
Linden, 1925
Long Branch, 1924
Madison, 1911
Maplewood, 1918
Montclair, 1921
Morristown, 1919
Neptune City, 1927
North Arlington, 1926
North Bergen, 1921
Ocean, 1922
Orange, 1918
Paterson, 1927
Perth Amboy, 1924
Plainfield, 1926
Pleasantville, 1921
Princeton
Prospect Park, 1917
Rahway, 1909
Red Bank, 1927
Ridgewood, 1925
Roselle Park, 1928
Scotch Plains, 1926
South Orange, 1918
Springfield, 1923
Union, 1927
Union City, 1926
Weehawken, 1926
West Orange, 1900

New York
Albany, 1926
Amsterdam, 1924
Auburn, 1916
Buffalo, 1922
Dunkirk
Elmira, 1925
Floral Park, 1929
Geneva, 1924
Glens Falls, 1911
Hornell, 1919
Hudson, 1892
Jamestown, 1908
Johnstown, 1917
Lockport, 1893
Mount Vernon, 1921
Newburgh, 1925
New York City, 1924
Niagara Falls, 1927
Olean, 1918
Poughkeepsie, 1925
Rochester, 1922
Rome, 1919
Rye, 1923
Scarsdale, 1924
Schenectady, 1921
Scotia, 1905
Syracuse, 1923
Tonawanda, 1920
Utica, 1928
Watertown, 1923
Watervliet, 1921
Yonkers, 1921

North Carolina
Asheville
Charlotte
Durham, 1922
Greensboro, 1914
Hickory, 1925

North Dakota
Grand Forks, 1912

Ohio
Akron, 1928
Ashtabula, 1919
Barberton, 1921
Canton, 1925
Cincinnati, 1924
Cleveland, 1921
Columbus, 1928
Dayton, 1928
Geneva, 1904
Youngstown, 1907

Oklahoma
Bartlesville, 1912
Drumright, 1915
Enid
Muskogee, 1923
Oklahoma City, 1923
Ponca City, 1924
Shawnee, 1928

Oregon
Eugene, 1914
Marshfield, 1910
Portland, 1924

Pennsylvania
Abington, 1925
Allentown, 1918
Altoona, 1920
Ambridge, 1925
Beaver Falls, 1922
Bethlehem, 1925
Duquesne, 1925
Easton, 1917
Edgewood, 1916
Harrisburg, 1926
Kingston
Lancaster, 1926
Norristown, 1918
Philadelphia, 1921
Pittsburgh, 1911
Reading, 1929
Scranton
Wilkes-Barre
Wilkinsburg, 1914
York, 1915

Rhode Island
Newport, 1921
Woonsocket, 1920

South Carolina
Camden, 1908
Charleston, 1914

South Dakota
Aberdeen
Sioux Falls, 1926

Tennessee
Chattanooga
Elizabethton, 1928
Knoxville, 1924
Memphis, 1913
Nashville, 1925

Texas
Abilene, 1926
Alpine, 1921
Beaumont, 1922
Big Spring, 1925
Cleburne, 1916
Corpus Christi, 1928
Corsicana, 1924
Dallas, 1923
El Paso, 1910
Fort Worth, 1923
Galveston, 1928
Goose Creek, 1928
Laredo, 1921
New Braunfels, 1925
Pampa, 1928
Plainview, 1909
Port Arthur, 1923
San Angelo, 1926
San Antonio, 1914
Sweetwater
Weatherford, 1907

Utah
Salt Lake City, 1924

Vermont
Rutland

Virginia
Charlotteville, 1924
Newport News, 1922
Norfolk, 1918
Peterborough, 1920
Portsmouth, 1920
Richmond, 1922
Roanoke, 1928

Washington
Aberdeen, 1918
Seattle, 1920
Spokane, 1922
Tacoma, 1925
Wenatchee, 1925

West Virginia
Huntington, 1920
Wheeling, 1927

Wisconsin
Beloit, 1916
Madison, 1927
Milwaukee, 1923
Sheboygan, 1917

Wyoming
Casper, 1918
Cheyenne, 1924

Canada
Edmonton, Alta., 1923
Vancouver, B. C., 1923
Victoria, B. C.
Winnipeg, Man., 1920
St. John, N. B.
St. John's, Newfoundland, 1917
Brantford, Ont., 1918
Fort William, Ont., 1920
Kitchener, Ont., 1923
London, Ont., 1921
Ottawa, Ont., 1923
Peterborough, Ont., 1920
St. Catherines, Ont., 1914
Toronto, Ont., 1920
Windsor, Ont., 1921
Montreal, Que., 1922
Moose Jaw, Sask., 1928
Regina, Sask., 1923
Saskatoon, Sask., 1919

Concerning the foregoing list of cities, we want to say that the dates given are as correct as our limited knowledge allows. No doubt there are many cities operating under codes of more recent date than our table shows. In this connection, we would say that we have made several earnest endeavors to obtain the latest available information from each city and town in the country, and while the response has been good, we feel sure that much information has not been sent to us, which if in our possession would have made quite a difference in the list we here show.

It is not too late to send us information of changes, inaccuracies, etc., also codes of cities and towns not at present represented in our list. If enough of these were to be submitted, we would gladly publish another such list later on, with the changes shown.

About three years ago, in 1926, we published a similar list, with several tabulations. In our present list, there are ninety additional codes.

Just as a matter of comparison, and for whatever it may be worth, we have averaged the dates of the codes shown in the first list, also of those shown in our present list. Such an average of course, has to leave out of account those cities and towns whose codes are not dated.

This method of averaging shows that in 1926, the average date of our list of plumbing codes was 1916. This means that in 1926 the average code was 10 years out of date.

The average of our present list of codes shows 1922 as the result. This means that the average plumbing code at the present time is only 7 years out of date.

In the last three years then, the average plumbing code has become 3 years nearer to being up to date.

It seems to us that this is a very remarkable gain. If the same gain could be made for the next few years, we would soon find the entire country installing their plumbing equipment according to modern methods.

Such a comparison as this has its limitations of course, and in some respects does not represent the value that it seemingly indicates. For instance, the fact that the Louisville, Ky. code has the date of 1927, would naturally lead one to think that this city was working under approved methods, but so far as we know, this is not the fact.

On the other hand, we have no doubt that some of the municipalities dating far back, have come up in this respect in the last three years, and that the average at the present time would actually be better than our figures show.

It will be of some interest to see how the different states stand regarding the average age of their plumbing codes, and we are giving this information in the accompanying table.

(Continued on Page 147)

HAROLD L. ALT

Writes in detail on the helpful selling value of

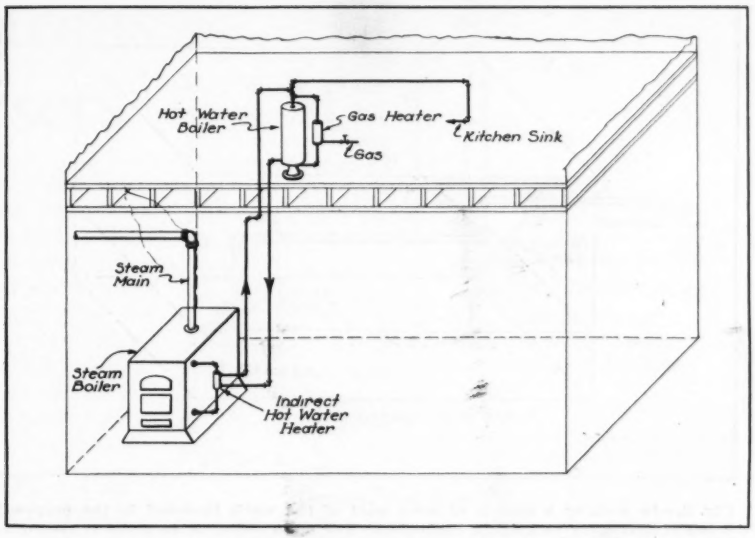


Fig. 1.—A drawing such as this will do much toward obtaining a contract when submitted with a proposal.

Making Attractive Proposals

THE making of a proper and attractive proposal oftentimes does much to aid a contractor in securing work. It is more or less astonishing how much work there is that has the contractor selected without any personal contact between the parties awarding the contract and the contractor himself. This particularly is liable to occur when the awarding of work lies in the hands of a committee and not infrequently takes place when the owner and architect get together for the purpose of deciding on the lucky party to whom the work is to be awarded.

Naturally the proposal is not the whole battle but a good proposal is a material aid which, if backed up by a price which is right and a reputation which is good, may result in throwing the contract to the maker of the proper type of proposal. On very large contracts the form of proposal is often included in the specifications, in which case the contractor has no option but to follow (with the greatest possible care) the form given to avoid having his tender thrown out on a technicality.

But such cases are the exception rather than the rule in the ordinary run of work, and every contractor knows how frequently he is in receipt of a set of plans and a short memorandum asking him for a price on the job. Oftentimes no plumbing fixtures are specified, the selection being left to the contractor's judgment, and in other cases the matter of street connections, roof leader connections, or hot water supply is either very vague or is not covered in the memorandum at all.

When this occurs, the contractor is thrown on his own resources and must submit an estimate clearly stating just what he intends to furnish and how much it is going to cost. There are two advantages in doing this; the first is that a detailed outline of the work included always has a reassuring effect on both the architect and the owner, and the second is that it protects the contractor from unreasonable expectations as to what he is to do for the contract price. A vague letter is interpreted by the receiver as meaning the maximum and by the sender as meaning the minimum; this is only human nature.

Then when it comes to the installation, disputes are liable to arise, ending—in most cases—with the contractor giving more than he intended and with the owner receiving less than he expected. Both of these conditions are bad.

Forms of Proposal

Every proposal should start off with a general description of the work included in the price quoted, with particular emphasis laid on the exceptions which are not included. Or, if desired, the exceptions can be covered in a note at the end of the proposal stating that no work of such-and-such character is included in the price quoted.

This first paragraph of the proposal may be written somewhat as follows:

We propose to furnish and install a complete system of plumbing (and heating) in the building located at (address), the work to be complete ready for owner's use, except that no ....., ..., and ..... are included.

The next paragraph should outline in general the heating system proposed and may read somewhat along the following line:

Heating

The heating system will be a one-pipe gravity steam system with a circuit main and wet return. Single pipe risers will be carried up to and will be connected to the inlet of each radiator.

From this more detailed items may be proceeded with, such as the boiler, radiators, valves, covering and so on.

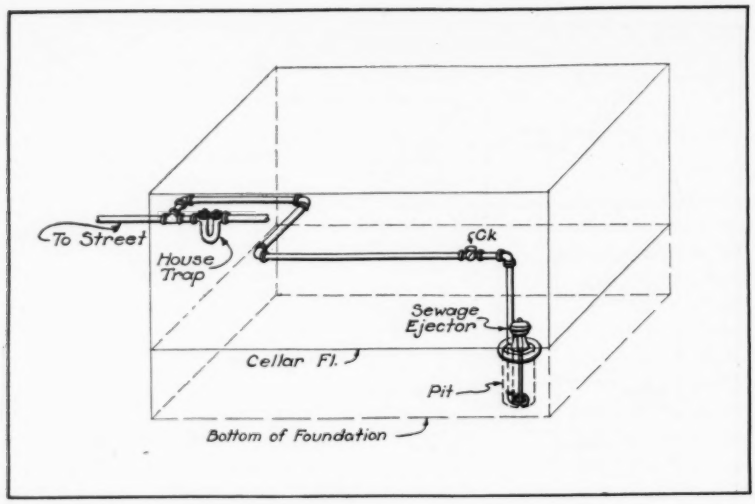


Fig. 2.—In making a sketch of some part of the work included in the proposal, it is not necessary to make it elaborate. The main object is to make it simple so that anyone will be able to understand it

The third paragraph should be devoted to the boiler description for which the following may serve as a guide:

Boiler to be supplied with a No. ..... of ..... make with .... sections and complete with automatic regulator, water column, gauge glass, try cocks, steam gauge, safety valve, grates and drain cock. Boiler will be of ..... sq. ft. rating and is guaranteed to be of sufficient capacity to maintain steam pressure on the system without undue forcing. Boiler shall be connected to chimney with smoke pipe of No. 18 gauge galvanized iron with hand damper and cleanout door.

Next after the boiler would come the matter of radiators which may be covered very briefly by:

Radiation throughout will be of the tubular type with legs as manufactured by....., where concealed brass radiators are required such as in .... and ..... rooms, they are included in price given.

Then would come radiator valves which may be placed in the same paragraph with the radiation saying:

All radiators will be supplied with nickel plated brass radiator valves of ..... make on the supply end and with ..... Co.'s automatic air valves on opposite end.

Then pipe and fittings may be mentioned, stating that:

All pipe will be best quality black merchant steel pipe with black coat iron screwed fittings, to which may be added that:

All lines will be run exposed (or concealed) and basement steam main in cellar will be covered with 1 inch of asbestos pipe covering. Boiler will also be covered with 1 inch of plastic asbestos with hard plaster finish.

If the contractor intends to paint the job he should add that:

All exposed piping and radiators in finished rooms will be painted with one coat sizing and one coat of silver (or gold) bronze.

A neat point to bring out is:

All pipes entering or leaving floors or walls will be provided with nickel plated wall and floor plates and sleeves.

A very important point to emphasize is the guarantee which can be put in this form:

All work is guaranteed against any and all defects of workmanship and materials not due to natural wear and tear for a period of one (or two) years. We also guarantee that when properly operated this heating system will maintain a temperature of not less than 70 degrees Fahr. with an outside temperature of zero and no wind (or with wind blowing not to exceed 15 miles per hour).

In connection with the plumbing work the same system should be followed, the first paragraph reading:

We also propose to install a complete system of plumbing ready for owner's use, consisting of hot and cold water supply, drainage and vent system, connection to street sewer and gas piping. We have not included ....., ..., and .....

After this a paragraph giving a short description of the system should follow and the character of the piping can be mentioned, thus:

The drainage system will be arranged to flow by gravity to the street sewer, with soil and vent stacks extended up through the roof. All work will be carried out to meet the requirements of the ..... plumbing code. Drainage piping will be extra heavy cast iron, and water piping will be first class standard weight galvanized steel pipe with galvanized fittings.

Then, a detailed description of the plumbing fixtures should follow; this is most important as the owner often spends more time in selecting the plumbing fixtures than he does in selecting his contractor. The detailed description, however, should not be too technical, and on this account the ordinary fixture specification would hardly meet the need. Fixture descriptions should be short, written in a way to be comprehended by the average person. For instance:

The plumbing fixtures to be installed will be first class in every respect and will consist of ..... water closets with vitreous china bowls, white seats and covers, vitreous china flush tank, china bolt caps with all trimmings of nickel plated brass, with white china handles ..... Plate No. ....., ... lavatories, vitreous china high back, 18 inches by 21 inches, four ball faucets, P-trap to wall, supported on concealed wall hanger, with all trimmings of nickel plated brass with white china handles ..... Plate No. .... bath tubs of built-in type, enameled iron, 5 feet 0 inches in length, with shower over, and nickel plated brass trimmings with white china handles.

One kitchen sink, integral high back, enameled iron, 36 inches long, P-trap to wall, combination faucets with swing spout, supported on concealed wall hanger and with all trimmings of nickel plated brass.

After this the matter of covering—if any—may be mentioned and then the guarantee should be given, this guarantee being practically the same as given in the

(Continued on Page 148)

Tops *and* Bottoms *of* Service Risers

SERVICE risers are of three classes—hot water supply, hot water return and cold water—and of two kinds—up-feed and down-feed. There are many ways of starting off and of terminating such risers, but there are also certain practices which may be regarded as more or less standard. The following will illustrate the various cases as carried out in the best class of work.

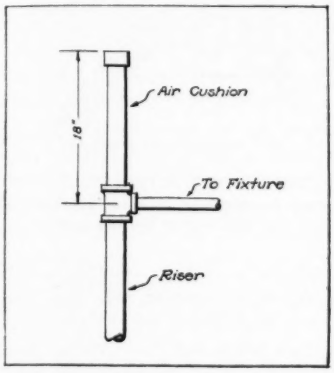


Fig. 2.—Typical top termination for up-feed cold water riser with air cushion

Up-Feed Cold Water Risers

In up-feed cold water lines, the cold water main is located in the basement or lower story and the branches are taken off horizontally and run over to the risers which proceed upward from the branch runout to the highest riser branch, where they terminate. This arrangement is essential.

At the bottom, somewhere between the riser and the main, a gate valve should be provided for cutting off the riser in case of repairs, extensions and alterations. Between the gate valve and the riser—or at the bottom of the riser—a drain tee should be located with a valve having a hose thread so that, after shutting off the riser, a hose may be connected onto this valve—run to the nearest floor drain or fixture—and the entire riser quickly drained out. A flange union or screwed union is also incorporated somewhere in the runout, this being done more as an aid in installing than for any practical use in operation. The union, when used, should come between the gate valve and the riser, so that in case of a leak, the leak can be repaired by only shutting off the riser, and not interfering with the main. A typical runout for an up-feed cold water riser is shown clearly in Fig. 1.

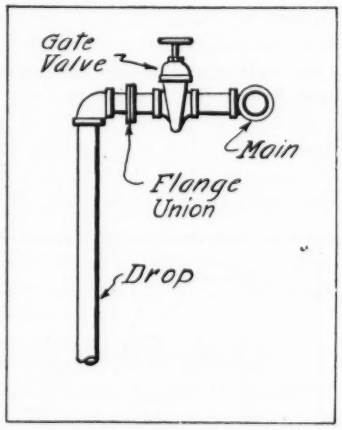


Fig. 3.—Typical runout for a down-feed cold water drop

At the top, the riser should be terminated with a full-size air cushion, about 18 inches high, to prevent water hammer. These cushions should come above the last branch tee, as shown in Fig. 2, so that they can be drained out without difficulty should they become water logged.

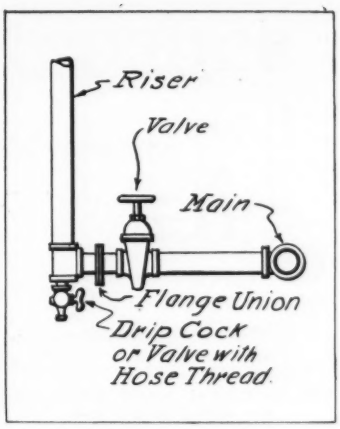


Fig. 1.—Typical runout for an up-feed cold water riser

Down-Feed Cold Water Risers

Where a down-feed supply is used, the cold water main is run generally in a hung ceiling above the top floor or exposed under the roof. From this main, horizontal branches are taken over to the drops which run down through the building, and the runout in this case is similar to that for an up-feed riser except that no drip tee is used. This is illustrated in Fig. 3.

At the bottom, the drop is carried down to the last fixture branch tee, and at this point has an air cushion turned up parallel to the riser. If it is impossible to drain off the riser through fixtures on the bottom branch, or if it is undesirable to use these fixtures for this purpose owing to inconveniencing tenants, etc., then the riser should be extended down to the basement or other point where a drain valve can be located. This type of termination is shown in Fig. 4.

Up-Feed Hot Water Supply Risers

Up-feed hot water supply risers are arranged much the same as up-feed cold water risers, the only difference being that they should be taken from the top of the main, or from an angle on the side, so as to permit the relief of air from the main into the riser at every branch connection. As the branches are almost always of smaller diameter than the main, this air relief is impossible except with top or 45-degree upward branch connections as illustrated in Fig. 5.

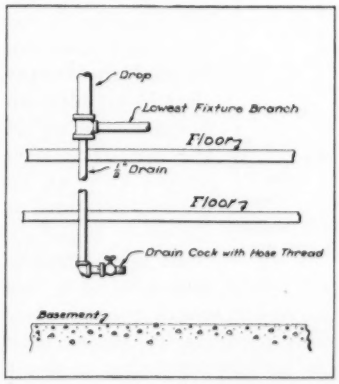


Fig. 4.—Typical bottom termination for cold water drop with drain to basement

At the top of the up-feed hot water supply riser, air venting of the riser

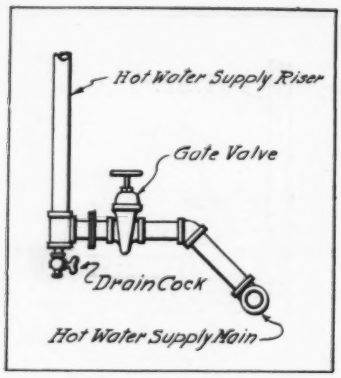


Fig. 5.—Typical runout for up-feed hot water supply riser

must be provided for, either by a vent continued to the house tank or by venting through the fixture outlet which is the more popular method. When venting through the fixture outlet, an air cushion should be run up above the highest branch tee, and the return circulation connection should be taken off just below the highest branch tee. This is illustrated in Fig. 6 below which clearly visualizes the exact details.

Up-Feed Hot Water Return Risers

On an up-feed hot water system, the returns are not supposed to have any connections taken off of them, although this is not always followed. For instance, where two hot water supply risers are located fairly near together, considerable pipe can be saved by making one of these risers a supply and the other a return, and hooking them together at the top with the sizes arranged accordingly.

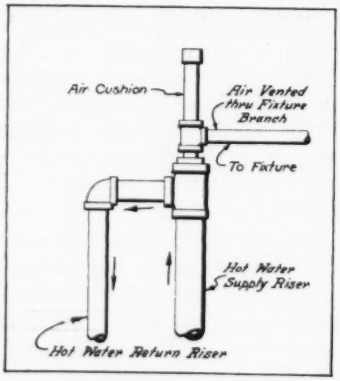


Fig. 6.—Typical top termination for up-feed hot water riser with air cushion

The top of the hot water return riser for a case where it parallels the hot water supply riser has already been shown in Fig. 6, but where the return riser is used to supply another group of fixtures and does not parallel the supply riser in an adjacent position, the top of the return riser should have an air cushion arranged as shown in Fig. 7.

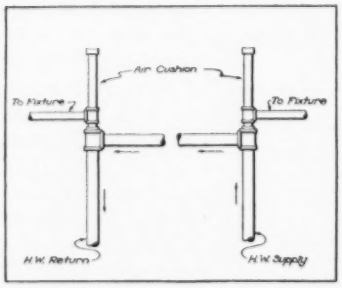


Fig. 7.—Tops of up-feed hot water supply and return risers when separated

At the bottom of the up-feed hot water return the arrangement would be the same whether the return closely parallels the supply or is widely separated. It is always necessary to use a check in this location to prevent colder return water being drawn back up the return and out of the faucets whenever the hot water faucets are opened. A connection arranged as shown in Fig. 8 will overcome this difficulty.

Down-Feed Hot Water Risers

All down-feed hot water risers are returns as far as the circulation is concerned, the supply, in this case, being carried to the top of the building all in one pipe known as the main hot water supply riser. This main riser runs to the top of the building, where horizontal distribution takes place and hot water is supplied to all the risers running down to the fixture locations. There is seldom any connection made to the main hot water supply riser. This is an important fact to bear in mind.

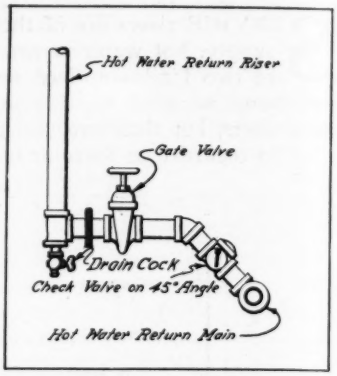


Fig. 8.—Typical bottom connection of hot water return riser

In the horizontal distribution system, all the piping is graded toward some high point where air relief is provided. The branches from this horizontal piping to the drops should pitch down toward the drop and should come out of the horizontal main in a downward direction at a 45-degree angle as shown in Fig. 9. A gate valve should always be placed on such runouts and the union—if any—should be placed between the gate and the top of the riser.

At the bottom of the hot water drops, air cushions should be installed, drip tees and drain valves with hose thread, check valves on a 45-degree angle and gate valves. The air cushion should be connected just below the bottom tee for fixture branches, and may be arranged as shown in Fig. 10. The drip tee and drain valve may be put in close to the bottom of the riser and the check and gate valve close to the main on a short drop which enters the return

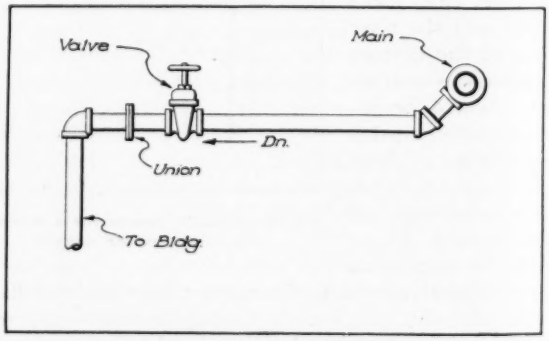


Fig. 9.—Typical runout for down-feed hot water supply

hot water main from the top at a 45-degree angle as shown.

The object of the check valve on a 45-degree angle, is to have the tongue hang vertically so that

(Continued on Page 150)

Heating Plant Maintenance

Service business which will carry the organization over slack periods

By H. T. HALL

IN THE hustle and bustle of life, the average heating contractor passes over a great deal of work which might be his by a little judicious cultivation. When heating systems were a new factor, the heating contractor had no old systems which required revamping; in fact, the new systems being installed were generally quite experimental enough to keep the heating contractor on his toes just trying to make them operate.

But, in recent years, a larger and larger number of good heating plants have been installed and, as a result, each year sees an increasing number of good plants reaching the state where they should be revamped. Because they are good heating systems they can be reconditioned at a fraction of the expense which a new plant would cost.

Sometimes only the interior trap mechanisms need replacing, again the valve stems need repacking or the air valves replacing; in still other instances additions or extensions have been made which overload the lines and require short lengths of new main to obtain proper operation. The defects to be remedied in each reconditioning job constitute an individual problem in each instance, and must be carefully studied by a competent man before the work is started.

Care During Summer Months

Every heating system requires certain care during the summer months and one careful going over before firing up in the fall. This can be worked into quite an important side line if properly handled.

For instance, how many owners know whether they should drain out their heating systems during the summer or not? How many of them know how to clean a gauge glass? How many of them realize the importance of keeping the ash pit clean?

Cleaning Out New System

In every new system there is a certain amount of dirt, scale, and sludge which washes out of the system and accumulates in the boiler. This, of course, should be gotten rid of as soon as possible, and during the first heating season draining a little water off the boiler (that is, until the water comes clear) is a most excellent practice. This may be done once a week or once in a fortnight or once a month according to how much dirty water is drained off before clear water replaces it.

It is very likely to be the case that more rust and corrosion will be found in a gravity or vapor steam system than in either a vacuum or hot water system all other things being equal. In the first place a vacuum or hot water system is practically a closed system and the oxygen or air, after being once expelled or neutralized by chemical action on the iron, has little continuous corroding effect.

Effect of Air in the System

With the gravity steam or even the vapor system the air, constantly at various times during the day when the system is operating, enters and leaves the radiators and piping resulting in a constant supply of oxygen being furnished to assist the water in rusting out the iron.

Card of Directions

One of the greatest little advertising stunts which has ever been evolved in the heating business is that of furnishing a direction card for the care of the heating system with the contractor's name in big letters on the bottom and a note, "In case of trouble call ——," which every owner is glad to hang in his cellar for the sake of the information it contains and when trouble comes he is most likely to call the number given on the bottom of the card knowing that someone is waiting and anxious to help him out of his difficulty.

Such cards should contain instructions as to how to operate the system and are best separated into three types, these being cards for:

1. Hot Water.—2. Vapor.—3. Gravity Steam.

If all of these are printed on one card it will be cheaper but the danger of confusion and using the wrong set of directions is serious enough to justify the separate cards.

For the ordinary hot water system, the following items should be covered:

(a) Filling the system.
(b) Starting the Fire.
(c) Adjusting the Drafts.
(d) Air Valves on Radiators.
(e) Banking the Fire.
(f) Keeping the Ashpit Clean.
(g) Closing down for the Summer.
(h) Draining out and Cleaning.

For vapor systems the items covered should be (a), (b), (c), and (e) same as before, but modified suitably, and with (d) omitted and (f), (g) and (h) the same. A method of cleaning the gauge glass and trying the safety valve should also be included.

For gravity steam systems, the same list as for vapor but altered to suit gravity work should be used, and the item on air valves should be included.

Hot Water Suggestions

In small gravity hot water heating jobs the first and most important item to attend to before lighting the fire is the matter of filling the system with water. This must be fully carried out before any fire is lit in the boiler. The next point is to cover the grate with a light covering of ashes to protect it against excessive heat of

a new fire built directly on the iron; the paper, fine wood and heavy wood may be put in, one on top of the other; then all the draughts should be opened and the paper lit.

As soon as the wood is fairly well caught a covering of coal should be sprinkled over the top of the wood, only about enough to fill in the crevices and not enough to entirely cover the wood. A little later, when the wood is about half consumed, about 2 inches of coal is placed over the top of the fire and this is left until all the coal is thoroughly ignited. Then, and not until then, should a heavy charge of coal be placed in the boiler and the draughts should be left open until this coal is well ignited. The above applies to anthracite coal of ordinary large size such as is customarily used for small heating boilers. Where soft coal is used the fire can be started with much less care owing to soft coal igniting much more easily than hard coal.

The ash pit should be thoroughly cleaned out and kept clean at all times to avoid overheating and damage to the grate bars.

After the boiler fire has been going long enough to heat the water up to about 180 degrees Fahr., the regulator should be set to close the draughts as soon as this temperature is reached. Ordinarily a hot water system will be operated by hand control of the chimney damper but the boiler regulator should always be kept attached and ready to operate in case of the fire coming up quickly or the attendant forgetting to close the chimney damper.

When it is desired to bank the fire, shake the fire well until a few live coals fall into the ash pit; cover the fire with a heavy bed of coal and close all draughts. In cases of very good chimney draught it may be necessary to unlatch the fire door to prevent the fire burning out. This will also occur on windy nights.

Air valves on radiators should be opened when the system is first filled up and then, after all valves have been opened until the water comes, the system should be refilled to its proper level. During the heating season air valves should be opened anywhere from once a week to once a month especially where a radiator seems to be at a lower temperature than the other radiators on the system.

During the summer the system should be kept full of water although it is a good idea to run off any dirty water when closing down and to refill with clean water. In the fall repeat the operation and everything will be ready to go. Outline number one is a suggested form of direction card for gravity hot water system.

"In recent years a larger and larger number of good heating plants have been installed and, as a result, each year sees an increasing number of good plants reaching the state where they should be revamped." Mr. Alt suggests a number of service jobs and the manner in which they may be handled efficiently.

Outline Number One

Directions for Gravity Hot Water Heating Systems

(a) Fill the System to its proper level, release air from air valves if any as explained in (d) and refill.

(b) Build the Fire by putting a thin layer of ashes over the grate and follow this with paper, fine wood and kindling. Coal should only be added in small quantity after the large wood is well ignited and a heavy charge of coal should not be added until the lighter charge has been thoroughly ignited all over.

(c) Open All Drafts until the system is thoroughly heated up and the water reaches 180 degrees Fahr. Then, set the regulator to close the draughts at this temperature.

(d) Allow Air to Escape from all air valves (if any) by slightly opening each one until water shows. Do not forget to refill the system with water each time after releasing all the air from the air valves.

(e) To Bank the Fire clean out the fire well by shaking out the ashes and recharge with a heavy covering of coal. Close all the draughts after giving a little time for coal gas to pass off and unlatch fire door if necessary.

(f) Keep Ash Pit Clean because a clogged ash pit will result in the grate bars overheating which causes them to warp and burn out. The ashes only have to be removed once so do it first and not last.

(g) Closing Off in Summer only means to run off the dirty water in the bottom of the boiler and refill with water to proper level. When standing in this condition, papers and rubbish can be burned in the boiler from time to time which results in drying out the smoke pipe and chimney thus serving to reduce corrosion from dampness.

(h) Drain Out Dirty Water in the bottom of the boiler from time to time until all the dirt is cleaned out of the system. The removal of a plug from one of the return tappings and the use of a strong stream of water from a hose nozzle is recommended at the end of the first heating season.

(i) Finally have your system looked over every year and minor defects remedied before they become expensive ones.

(j) If You Do Not Understand any of the above directions or if you need help call

JOHN SMITH
TEL. 010101
13th St., and 14th Ave., City.

Vapor Steam Suggestions

There are so many types of vapor steam systems that perhaps it hardly is practical to try and prepare a standard card of these systems. Yet the basic rules can be covered and the special devices will be the cause of more than one call on the contractor's services for first aid in understanding and adjustment.

A boiler used for vapor heating also has a safety valve and a steam gauge; the safety valve should be tried out at least once a week and every day is better. Every steam fitter is also familiar with the scheme of drawing muriatic acid up into the gauge glass to clean it.

With this in mind the card for a vapor heating job could be formulated somewhat along the outline shown in Outline Number Two.

Outline Number Two

Directions for Vapor Steam Heating Systems

(a) Fill the System until the water line shows in the

(Continued on Page 151)

"At the present time in this city we are having trouble in getting the co-operation of our city officials in the enforcement of the plumbing code.

"The master plumbers of Pontiac are endeavoring to obtain information which we hope will lead to strict enforcement.

"We have heard a great deal of what sewer gas can do, but do not know of any particular case where trouble of any serious nature had developed from faulty plumbing.

"Please give us any information on anything along this line that you may have."

Why Enforce Plumbing Laws?

R. M. STARBUCK, JR.

Answers a letter from a reader

WHY enforce plumbing laws?—This is a strange question to ask in this day of enlightened desire for those things that make for health and happiness, and yet a question that is often judged from one basis only, the basis of the cost in dollars and cents.

Enforcement of strict laws relating to the use of plumbing material and its installation, result in holding the architect, the builder, the plumbing contractor and the owner, to a far higher standard of excellence than would be possible without such laws. This naturally costs something. It costs something too, to maintain good streets, to control fire hazard, to keep the practice of physicians on a high plane—in fact it costs something to do or get anything that is worth while.

Perhaps one of the greatest factors opposing the enforcement of plumbing laws is speculative building, and many times the power that real estate interests hold, are sufficiently great to almost entirely block any revision of laws looking to improved plumbing conditions. And, the reason these interests prevail is that the general public is often too ignorant of the subject, too passive, or too engrossed in other things, to make a stand for correct plumbing conditions.

Always, if the public actually demanded something better, they would surely obtain it.

Questions from Pontiac, Michigan

These remarks are brought out by the recent receipt of a letter from Pontiac, Mich., which we quote as follows:—

"At the present time in this city we are having trouble in getting the co-operation of our city officials in the enforcement of the plumbing code.

"The master plumbers of Pontiac are endeavoring to obtain information which we hope will lead to strict enforcement.

"We have heard a great deal of what sewer gas can do, but do not know of any particular case where trouble of any serious nature had developed from faulty plumbing.

"Please give us any information on anything along this line that you may have."

We would suppose the necessity of perfect living conditions to be too well established in the minds of all thinking people, to require that definite instances of harm from sewer gas should need to be brought to any city official's attention, in order to prove to him why plumbing laws should be enforced.

Investigation Shows Little Danger from Sewer Gas

Even supposing that it should be proved that there is little actual danger from sewer gas, would anyone become willing therefore, that his family should live in a house wide open to the entrance of sewer air through defects in the plumbing system?

As a matter of fact, modern investigation has proved conclusively that the great fear in which we have always stood of sewer gas, is largely groundless. Even with this comforting assurance however, is there one of us who would therefore be willing to exercise any less caution in the protection of his family? In other words, does the assurance given us by the modern investigators of these things, make us want to take a chance?

But why give entire attention to this one phase of the subject? Let us see what some of the general considerations are regarding the dangers of inferior plumbing, and the need of enforcing strict plumbing laws.

President Hoover, while he was secretary of the U. S. Department of Commerce, saw the need of a more intelligent handling of plumbing, both in its installation and in its supervision, and accordingly appointed a commission, which for more than two years studied and experimented under the guidance of the U. S. Bureau of Standards. Later a remarkable report was published, containing the recommendations of the commission. This report may be considered the country's standard. We want to quote from the Hoover Report, as follows:

Relation of Plumbing to Health

"An important function of the house-drainage system is to carry away from plumbing fixtures human excreta and wastes which may contain disease-producing bacteria. Because of the possible presence of such organisms, sewage may be dangerous, and must be disposed of in such a manner that there will be no chance of disease transmission. Sanitarians today place great emphasis on the importance of sewage treatment and safe methods of ultimate sewage disposal.

"The leakage of polluted water from the house-drainage system is insanitary and dangerous. Leakage within the house may pollute the habitation and permit food infection through the medium of insects. Leakage in the ground outside the house may pollute water supplies taken from neighboring wells, or find its way into or under the building. The maintenance of water seals between fixtures and drains, and the

permanent tightness of plumbing systems are important not only because they prevent the passage of air, but because they prevent the access of insects to the interior of the drains and sewers. If cockroaches, water bugs, and other vermin can pass from drains to food, they may transport disease germs, and thus be a bacteriological menace to health. It is therefore important that the drainage system be tight and without danger of leakage.

"L. O. Howard, chief of the Bureau of Entomology of the United States Department of Agriculture, and C. W. Stiles, United States Public Health Service, in personal conversation with the chairman of the committee, are authority for the statement that insects can and do pass from the interior of leaking drainage systems to living quarters. Several other observers also report such occurrences.

"Another danger to be guarded against is the use of fixtures in which the water supply and waste connections are so arranged that polluted waste water from the fixtures may, under certain circumstances, return into the water-supply pipes.

"The line where the safe water supply ends and sewage begins is sometimes very finely drawn. . . .

"The air in sewers and drains often contains gases resulting from the decomposition of excreta, soap, fats, and other wastes, together with gases from mineral oils which may come from garages, streets, and industrial establishments. Illuminating gas may also find its way into sewers through leakage. Among these gases may be found methane, sulphuretted hydrogen, and carbonic oxide. In large amounts those gases are poisonous to the human system, and there are physiological objections to breathing them even in small quantities. Hence, the air of sewers or drains should be kept from entering buildings intended for human habitation or occupancy, by the use of proper plumbing installations and by suitable ventilation of the rooms or compartments in which the plumbing fixtures are located. The smell of these gases and other emanations from decomposing organic matter is naturally repugnant to human beings. It not only offends the sensibilities, but may produce shallow breathing, headache, and even nausea.

"In addition to the above facts, it is important to consider the bacteriological aspects of sewer and drain air, a subject upon which there has been some misunderstanding. In recent years bacteriologists have made studies which have thrown light upon this subject. They have shown by experiment that while sewage often contains disease-producing bacteria derived from human excreta and body wastes, these bacteria are rarely found in the air which escapes from sewers and drains. Hence, it has been argued by some that escaping sewer air has no influence on health. The committee does not agree with this conclusion. Health may be influenced by factors which do not cause specific diseases, for there are chemical and physiological as well as bacteriological factors involved. The investigations thus far made by bacteriologists should be considered to be merely a beginning of larger and more complete investigations which will doubtless be made as the science of bacteriology advances. The committee is of the opinion, therefore, that until further light on this somewhat obscure subject has been obtained, the escape of sewer air from the house-drainage system, at frequent intervals or in considerable quantities, threatens the health of the building's occupants.

"This whole matter has a quantitative as well as a qualitative aspect. The temporary losses of water seal in traps, which rarely occur and which are immediately replaced, do not involve any great danger to the health of the occupants, for in many cases the final drainage from the fixture will renew the seal within a short time, but where a loss of seal is likely to be of frequent occurrence and not readily replaced, or where breaks in the system admit sewer air continually to a building, the health of the occupants is subject to the dangers heretofore described.

Public Control of Plumbing Justifiable

"For the above-mentioned reasons, regulations governing the installation of plumbing have been established by law in many places. These regulations have been potent in improving living conditions throughout the country; in fact, they have even set the standards for those places where plumbing is not under public control. The knowledge now in possession of sanitarians in regard to the lessened bacteriological dangers of sewer air, leads logically to some simplification in plumbing design, but it should not lead to an abandonment of practices necessary to protect buildings against the air of drains, which, in addition to its possible danger, is offensive to the smell.

"The committee believes that good plumbing is a matter which concerns health. Government has the right to protect the people's health, but people also have rights, and plumbing regulations carried too far are unjust. Regulations which will not be supported by the courts fully and without question, under a liberal interpretation of the police power, may be regarded as unjust. Sanitary science, however, must be the guide to justice in this matter. The principles of science change as knowledge advances, and it is proper therefore, that plumbing regulations be reviewed from time to time and, if necessary, revised."

The foregoing seems to us a very just summation of the subject which we are discussing. It should be borne in mind moreover, that the Hoover Report, from which this is taken, is not a prejudiced publication, and we may add that its recommendations have done much toward the simplification of plumbing, with a consequent reduction in its cost.

The State of Ohio was one of the first states to give attention to plumbing installation and supervision. This state has enacted a plumbing code which is enforced throughout the commonwealth. From its early pages we quote the following:—

"A second-class plumbing and drainage system in cost, will prove itself a second-class system in service. A year or so in service will reveal the inefficiency of the fixture, device or construction. Dis-

(Continued on Page 152)

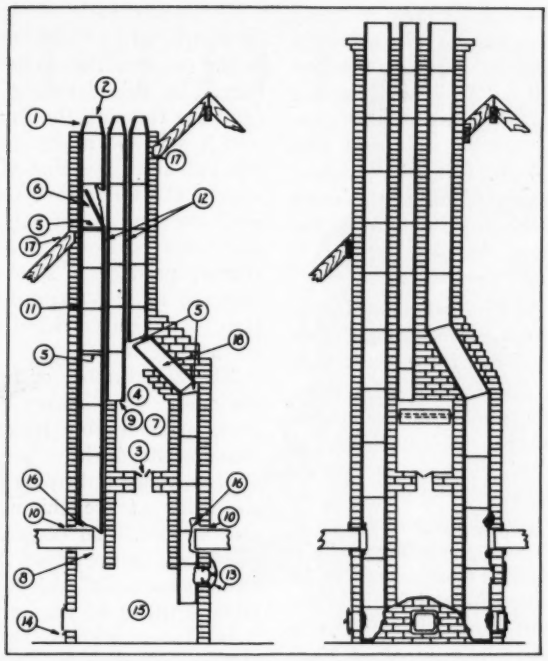


Fig. 1.—Diagram indicating in one instance many of the more common defects which are found in chimneys, and in the second instance their elimination in a correctly built chimney

Here are eighteen errors in the design and construction of the Chimney *to be checked when* Looking *for* Heating Trouble

Article No. 3

By ROBERT R. KENWORTHY

TROUBLE is found in chimneys both on account of errors made in design and construction and because of deterioration. In order to show clearly, both the right and wrong conditions, the diagram accompanying gives on the left the incorrect arrangement and on the right the same chimney but with the defects removed. Eighteen erroneous points are noted by the numerals which are explained and corrected by the numbered paragraphs below:

1.—This chimney is altogether too low, as it does not clear the top of the roof. When the wind passes over the roof before it comes to the chimney it is bound to send air currents down onto the top of the flue and prevent the gases from being expelled. This will cause smoke to back out of the fire door or any other place that it can.

2.—An ornamental tapered flue tile has been placed at the top of the chimney to give a more finished appearance to it. The tapered tile is considerably smaller at the top than the flue is. A so-called eight by twelve inch tile is approximately seven by eleven and a half inches in inside measurement. It has

therefore eighty and one-half square inches in cross section free area. If the sides of the tile taper in just one inch from the bottom to the top, the top will measure five by nine and a half inches on the inside, giving a free area of forty-seven and one-half inches or about 56 per cent of the total free area of the rest of the flue. Even this small reduction in the size of the flue measurements is therefore ruinous. The best rule to follow is to keep a domestic flue exactly the same size from bottom to top, eliminating even the smallest changes.

3.—An ash trap opening into the same pocket as the bottom of the flue provides a point of admission for air which counteracts the effect of the draft pull.

4.—Unvented space above the combustion chamber of a fire-place allows the smoke to accumulate and intermittently it will back out into the room in puffs. The backing out in this manner is largely due to the heat of the fire or small tongues of flame reaching minor volumes of gas and air which are in proper combination to ignite with some very slight explosive force which in turn dislodges more smoke and gas than the flue is capable of receiving for the instant. If the flue connects at the highest point in the combustion chamber this will be eliminated. Care should also be taken that the front opening of the fire-place shall not be excessively large in comparison with the size of the flue's free area. Some authorities on the subject have given the ratio of face area of the fire-place to the free area of the flue tile as twelve to one, while another goes as low as eight to one. With good chimney construction one might conservatively use the intermediate ratio of ten to one with good results.

5.—Leakage between joints of the flue tiles is highly detrimental to the draft conditions. Even if the amount of air admitted into the flue at such points is limited, the temperature of it is so low that additional heat must be given to the flue in order to keep the stack temperature at its proper level. Naturally this involves burning of extra fuel and is wasteful. From this it is obvious that careful cementing of the joints between the tiles is imperative. They must be both tight and smooth.

6.—Imperfect tile, seconds, or tile of inferior grade should never be used. These are liable to split or crack and give rise to imperfect flues. If they do not actually obstruct the flue as they deteriorate, and as the diagram shows, they are at least apt to open up and admit air which is undesirable. Obstruction far up in the chimney is often very difficult to remove and openings or cracks in the tile which are far out of reach are almost impossible to seal.

7.—When no damper is provided in the fire-place much heat of the room will be lost through the fire-place flue. A carefully installed tight damper should always be used and this should be kept closed except when there is a fire in the fire-place.

8.—When the smoke pipe is inserted too far into the flue the passage of gas is limited to the amount which will pass freely through the opening between the end of the pipe and the wall of the flue, not what the flue is capable of carrying.

9.—Lower ends of flues are sometimes found to be restricted by brick, mortar or other material used in the construction in some such manner as is shown here. In this case the maximum of smoke which can pass through the flue is governed by the amount which will normally pass through a flue opening equivalent to the size of the unrestricted area. The size of the flue above the restriction has little to do with the amount of gas which will pass through the restricted portion. A condition of this sort will, of course, produce a smoky fire-place unless the ratio, referred to in paragraph 4, is maintained with relation to the unrestricted area instead of the free area of the flue itself.

10.—No thimble or ferrule has been used nor has the smoke pipe shown been cemented in place. This gives considerable leakage of air into the flue and impairs the draft.

11.—Long unbroken voids between the tile and the brick of the chimney as shown here are highly undesirable. To cement the flue tile too firmly to the brick is not good because of conditions of unequal expansion and contraction, windage and possible settling of the whole chimney. Nevertheless, it is always well to build the brick around the tile sufficiently close to break the void at intervals and prevent the easy circulation of air through the necessary spaces.

12.—Flue tiles should never be set side by side without a tight wall of brick or other suitable material between them for rather obvious reasons. This wall must always run from the bottom of the chimney to its top.

13.—Openings into the flue which are not actually in use should be well capped and the opening into the tile must be carefully sealed. Inferior capping must be avoided and brick and mortar should be used. Should a more temporary seal be desired, cement a good thimble into the wall and seal it to the tile at its inner end, then set a well fitting metal cap into or over the outer opening sealing it in place with plastic asbestos or similar cement.

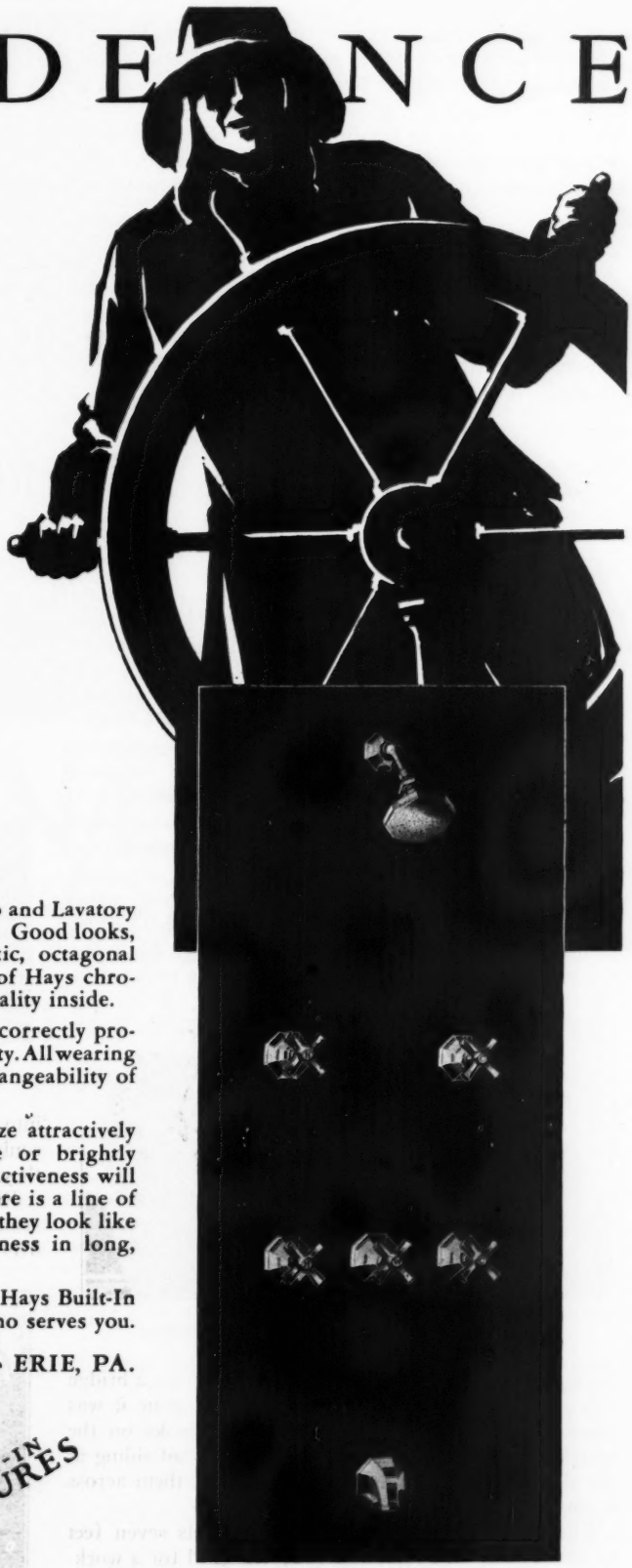
14.—Leaky clean-out doors, both on the chimney and the heating plant, should not be condoned. Replace them at once and see that they fit the frames snugly and that the frames are firmly set in suitable cement.

15.—The clean-out door must open into the base of one flue only. The arrangement shown at the left is entirely wrong as two flues which run together at the base through such an arrangement as this are bound to react upon each other. The ash pit in common with the flue base is an additional source of trouble as mentioned in paragraph 3.

16.—The gap that is formed between the brick and the tile at points where the tile must be broken through for the insertion of the smoke pipe must be carefully and suitably closed with cement whether a thimble is used or not.

17.—Wooden structure of the roof or other part of the house must never depend upon the chimney for support. The chimney may settle at an entirely different rate than the rest of the building so this practice is mechanically wrong. Then, too, the wood

CONFIDENCE



GOOD PLUMBING *should look like* GOOD PLUMBING

THE beauty of "Nuart" Fixtures for Shower, Tub and Lavatory quickly gains the confidence of your customers. Good looks, of course, don't mean everything; but the artistic, octagonal design, finished outside in the deep silver lustre of Hays chromium plating, is a convincing indication of the quality inside.

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may be set in such a way as to entail a fire hazard.

18.—Where tiles must be slanted for sufficient reason this slant should not be more than thirty degrees from the vertical for good practical results. Make this slant as long as feasible and as nearly vertical as possible. Make good mitered joints of the tile at both ends and cement these joints with unusual care.

Conclusion

The foregoing paragraphs are based on defects that have commonly appeared in the past few years. As many of them as seemed possible have been incorporated into this one hypothetical chimney. There are many others, of course, but we cannot put them all in together, so only the more common were selected. However, if good common sense is applied to chimney design and construction, there should be no serious defects.

The heating contractor should check the chimney as far as he possibly can. It is a sure thing that one of the most desirable points of any home is an efficient heating plant but without a good chimney no plant can be wholly efficient. The average owner uses his heating plant two hundred and forty days a year.

That means that if the chimney is poor the owner will condemn the heating contractor two hundred and forty times a year. Make your motto: Good chimneys build good will.

These Tanks Were Floated *to the* Job

Solve transportation problem by using river

THE MECHANICAL problems of the plumbing and heating contractor are not always installation problems. Sometimes the problem is to get the equipment into the building or to eliminate hand labor and carrying heavy pieces up several stories by the use of winches, etc. But here is a method, not often used, of getting equipment on the job, although doubtless it has been employed heretofore.

Ever increasing production at a large chemical plant in the South kept the construction department busy trying to find room for new buildings. The plant is located on the banks of a river, but is closely hemmed in by other plants, so that eventually further expansion on the mainland became impossible. In the river at this point is a large island that offered a solution to the problem of finding more space. It was planned to construct a bridge over to the island, but before this could be done it was necessary to install several large storage tanks on the island. As these were received on the railroad siding at the plant, the question arose of how to get them across to the island.

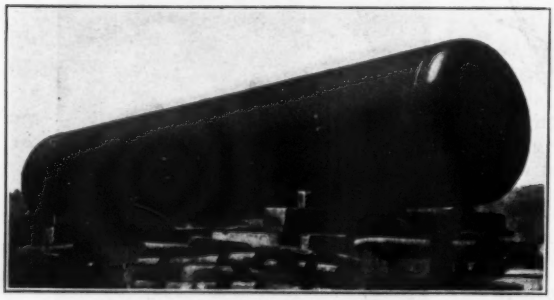


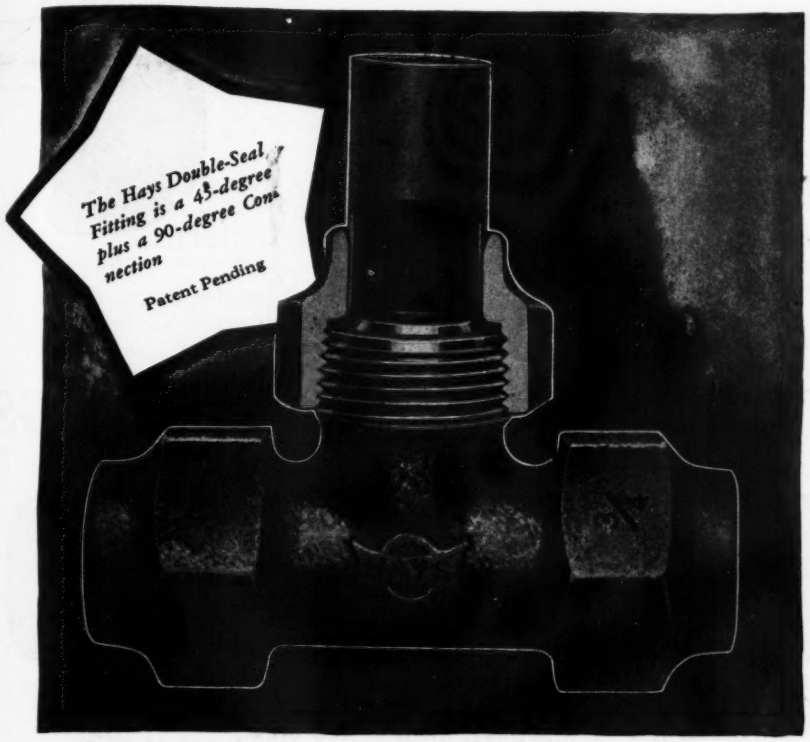
Fig. 1—A tank on skids ready for the plunge

These tanks were welded pressure vessels seven feet in diameter by thirty-five feet long, designed for a working pressure of 200 lb. per square inch. As it was easy to make the tanks completely watertight by merely closing the manhole and the few nipples for outlet and inlet connections, the contractor suggested that they could be floated across to the island. Accordingly the tanks were moved onto skids by the steep river bank. When the holding blocks were knocked away, the tanks slid down into the river, where a cable was attached so that they could be towed across to the island. On the island side they were drawn up the ways by means of a rope sling.

Fig. 2.—There she goes!

Readers of "Domestic Engineering" are requested to send in similar stories of difficulties encountered and overcome in a novel manner.

Fig. 3.—A tank ready for the tow line



★ Exclusive with Hays—this double-seal provides double strength, safety and ease of installation.

The 45-degree seat of the fitting holds the pipe in a wedge, making a seal that is absolutely tight.

The 90-degree seat is the shock absorber. It (1) locks the pipe, (2) provides a second seal of positive tightness and (3) protects the 45-degree seal by absorbing all pulling strains and vibrations.

NO ONE *but* HAYS

CAN GIVE YOU A DOUBLE-SEAL COPPER PIPE CONNECTION

The Hays copper pipe connection is the only one on the market today possessing this positive double-seal, double protection feature. Instead of one point of contact between the flanged pipe and the connection, Hays has made *two*—because it takes two for *both* the tightness and strength needed to make a plumbing installation permanently leakproof.

This exclusive connection eliminates threading and makes it possible to install permanent, troubleproof, economical copper plumbing in every home, large or small, by the Hays Copper Plumbing Method. No other materials, or combination of materials, can equal copper for plumbing because it has none of their disadvantages—yet it has every one of their desirable features.

The Hays Method is more profitable than most plumbers imagine. There is a good margin on the material itself, and the profit on the entire job will certainly surprise you if you think that you must sacrifice something to handle this quality plumbing. Write for details.

HAYS MANUFACTURING COMPANY, ERIE, PA.

HAYS DOUBLE SEAL *CONNECTION*

EVERY INDIVIDUAL WALWORTH BRASS FITTING IS AIR-TESTED UNDER WATER —A PRACTICE INITIATED BY WALWORTH

WALWORTH
FLAT-BAND RED BRASS FITTINGS

WALWORTH flat band fittings, made of red brass, are cast from a high corrosion-resistant alloy with tensile strength of 28,000 lbs. per sq. in. They are "quality fittings."

Although fittings may be the staple of the industry, they are also called upon to give reliable, long service, and especially is this true in brass pipe installations where durability is of supreme importance. Walworth red brass, flat band fittings insure consumers against replacement costs, through careful workmanship and excellence of materials.

In *design,* attention was given to grading the entire line to procure a consistent relation between sizes, uniformity in wall thicknesses and dimensions, and proper thread chambers. In *manufacture,* the making of patterns, core work, moulding, casting, tapping, inspection and testing are carefully supervised to obtain uniform high quality. In *appearance* Walworth brass fittings are clean and bright.

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Walworth Company, General Sales Offices: 51 East 42nd Street, New York
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LEGAL QUESTIONNAIRE

ANSWERED BY "THE JUDGE"*

Rights of Sub-Contractor Against Finance Company for Money Certified by General Contractor as Due Sub-Contractor

Editor, DOMESTIC ENGINEERING:—I should like legal advice on the question of liability in the following case: A plumbing and heating contractor is authorized to lay sewer and water to a building by a general contractor. The financing of the building is done through a finance house.

The general contractor files with the finance house a sworn statement of the amounts due the sub-contractors and includes the plumbing and heating contractor's work.

The plumbing and heating contractor, due to controversy with the general contractor, does not draw on the finance house for the amount set aside by the general contractor for some six to eight months.

The finance company then advises the plumbing and heating contractor that it had paid out, on the order of the owner, for insurance and other purposes, the money which rightly belonged to the plumbing and heating contractor.

The question which now arises is: What action should be taken by the plumbing and heating contractor, and to whom must he look for payment? Has the plumbing and heating sub-contractor any right of action against the finance house for not holding the money set aside? Would the fact that the plumbing and heating contractor did not draw his money within any specified time, release the finance company from the obligation to the plumbing and heating sub-contractor?

Illinois. A. L. V.

Answer:—The rights of the plumbing and heating sub-contractor, to whom I shall hereafter refer as the sub-contractor, will depend almost entirely upon his contract with the general contractor or the owner, and whether the finance company was a party to that contract. It will also depend upon the terms of the contract between the owner and the general contractor, and the agreement between the finance company and the owner, and whether the contract of the sub-contractor referred to the other contracts and also whether the other contracts referred to the sub-contractor's agreement and made it a part of their provisions and obligations.

As you do not state any of the terms of the various agreements and do not even state that the sub-contractor has a written contract with the general contractor, merely saying that he was "authorized to lay sewer and water to a building," it will be difficult to make any very definite statements regarding the sub-contractor's rights against the finance company.

In the first place, there would seem to be no question but that the sub-contractor has a perfectly good right of action against the general contractor for the work and materials which he performed and furnished, either under a contract of some sort or for the reasonable value of the work and materials provided that no contract price was agreed upon.

It would seem to be equally clear, that the sub-contractor's rights against the finance house will depend entirely upon the terms of the contract between the owner and the finance house, or the agreement between the owner, finance house and general contractor, and whether his contract is tied into the other contract with the finance house. This is so because I assume that the sub-contractor has no contract direct with the finance house and therefore has no rights against the finance house unless his contract with the general contractor is in some way tied into the finance house contract with the owner. In other words, if the sub-contractor has no contract with the finance house direct, and has no contract with the owner, through the general contractor, which will enable the sub-contractor to make a claim against the finance house, the sub-contractor cannot very well object to anything that the finance house may or may not do. Unless the finance house is under some obligation, because of its contract with the owner, with respect to the sub-contractor's rights, the finance house owes the sub-contractor no duty to withhold any money for his use. And even if the finance house is under an obligation to pay money to the sub-contractor, upon the order of the owner, that will give the sub-contractor no rights against the finance house unless the sub-contractor's agreement with the general contractor provides for his rights against the finance house either by direct provision or by reference and implication.

The foregoing rather indefinite statements are intended to convey the thought that merely because the general contractor filed a sworn statement with the finance house showing the amounts due to sub-contractors, that does not give the sub-contractor any rights against the finance house, unless the sub-contractor has rights which are stipulated in his contract, or which are given him by reference in the other contracts in the case.

It is very probable that the agreements in the case will give the sub-contractor a right to compel the finance house to pay him for his work and materials; but just what the sub-contractor's right is I cannot say without knowing the facts with regard to the various contracts and agreements.

(Continued on Page 95)

*Every effort is made to the end that these answers may be authoritative. However, we cannot assume any responsibility because of the very nature of the service, which is rendered without a personal interview.—Editor.

Give This Home Owner Your Advice on the Installation of Several Fixtures

BEFORE describing the plumbing problem that we are going to give you, we want to make some remarks concerning scale drawings.

We don't have to tell you that a scale drawing is used only because it would be a practical impossibility to make and use a full size drawing of a building. Even in machine drawing, scale drawings are very largely in use, and for the same reason. However, a scale drawing is in exactly the same proportions as a full size drawing would be, and tells exactly the same story.

There is no limit to the scales that are in use. A map may be drawn for instance, on which an inch may represent 100 miles, 1000 miles or even more. A machine drawing might be made on a scale of ½ inch= 1 foot. The plans for a large building might show a scale of ⅛ inch to the foot and a smaller building ¼ inch to the foot. The latter two scales will be found to be in quite general use among architects in the making of building plans. In general we might say that a scale is commonly selected that will best suit the size of sheet that is most suitable for the drawing. After once adopting a scale, it should be strictly adhered to, for otherwise the drawing will be thrown badly out of balance.

It may be there are some who do not understand how to use a scale, and so we will devote a little space to that subject.

If you will refer to the floor plans given in connection with our present plumbing problem, you will note that the scale given for them is 3/32 in. to the foot. That means that when you lay a scale on one of these floor plans, every 3/32 in. that you measure, stands for 1 foot in the measurement of the house itself. Then a measurement of 25 feet on the house itself would show on the drawing as 25x3/32, or 2 11/32 in.

It would be wonderful experience for anyone just beginning to study the subject of scale drawing, to take one or both of these two floor plans, figure out the principal dimensions and set them down on the plan, then take these measurements and use them to make a plan that would be on a scale of ¼ in.=1 foot. This would be well worth while.

Here Is the Problem

Now let us consider the drawing problem we have in mind, another of the remodelling problems.

The picture which is shown is of an attractive and comfortable 10 room residence. Figs. 1 and 2 show the first and second floor plans.

After the house has been completed the family is disappointed that there it not a more extensive plumbing equipment for their accommodation, and they come to you to get your advice as to how their requirements can be met.

There is a set of laundry trays in the cellar, just below the location of the kitchen sink. They want a sink and a water closet in the cellar, and you are at liberty to locate them where you think best.

On the first floor they want a water closet and a lavatory in addition to the present equipment, and these fixtures may be in the same enclosed space or in separate locations.

On the second floor they want two bath rooms, but do not want the separate water closet and lavatory that are now there.

After making the remodelled floor and cellar plans, then make your elevations of the plumbing, using your best judgment in same.

If you make an isometric elevation, make it on some definite scale.

In many instances the ability to make a workmanlike drawing for a plumbing layout for a remodeling job, for instance, counts for more in actually getting the job than mechanical skill.

A Secondary Problem

As a secondary problem;—using the scale on which the floor plans are drawn, we want you to make a complete list of the pipe and fittings required for the roughing.

If you have lists and discounts, it would be of interest to have you figure up the cost of the pipe and fittings for this job. If a number of the class do this, it will be interesting to see how the different remodelling plans compare in cost. If the owner of this house went to several of you for layouts and figures, this is exactly what you would be up against.

The Schoolmaster

Drawings Valuable in Selling Contracts

A man comes in and offers you a hundred dollars for your old automobile. He merely states that he will give you a hundred dollars. You think it is not enough and refuse the offer.

But the man is persistent; he gets out his pocket book, takes out a bunch of bills, he counts off by 10's and 5's and 1's until he has laid a big stack of bills in front of you. He does not bring out a single hundred dollar bill, oh, no. He makes a big pile of small bills rather than a small pile of big bills. You see the money on the table; you begin to think of how many places there are where a hundred dollars or fifty or ten are badly needed.

You begin (mentally) to spend this hundred dollars; soon you think about many places where you could spend five hundred instead of one hundred. The pile of money grows more necessary to you; it assumes greater importance; its value has increased since you saw it lying in front of you. It is a big pile! You do need some extra money and you accept the offer.

Psychology,—that is the answer. The money made greater impression upon your eye than the words "one hundred dollars" did upon your ear. You could see that a hundred dollars was quite a lot of money; you heard the words "one hundred dollars" but they did not register; seeing is often more convincing than hearing.

Now how does all of this apply to plumbing proposals? No connection at all, you say. Ah, but there is! Offer your tender as the man offered the pile of bills. Show that you appreciate the difficulties involved and that—before even tendering on the work—you have solved the problem or, at least, have found one answer.

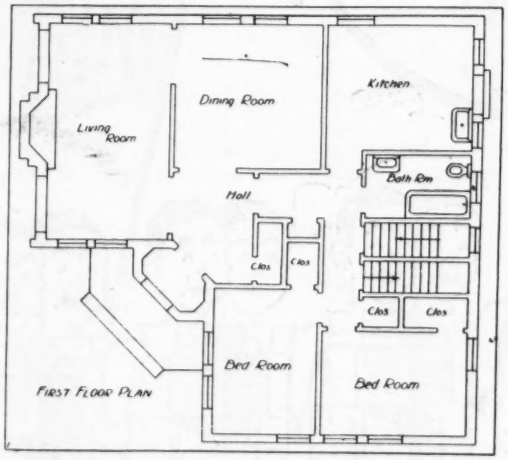
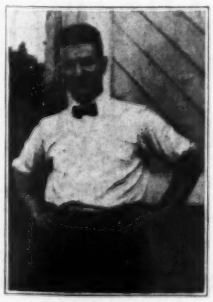


Fig. 1.—First floor plan



Wm. H. Hermann, class member, Eatontown, N. J.

You can do this by means of a few drawings or sketches which—if made so as to be clear and distinct — will assure the prospect that you have had interest enough to give some thought to the contract beyond the profit to be made.

For this reason, a study of such layouts as are shown in this problem is likely to be highly valuable to you at some later date. Send in a drawing today and join the "Domestic Engineering" Plumbing Class.

How to Make Drawings That Sell

Considering the sales possibilities in making drawings for plumbing layouts to be submitted to customers, it is surprising that the making of such drawings is not more common. It is not at all uncommon to see a plumbing contractor scratch out with a pencil on a piece of wrapping paper a layout for a remodeling job and show this to his customer.

Emil M. Hansen, class member, Somerdale, N. J.

This is OK so far as it goes, but if a neat drawing, well made on good paper is submitted, there is no question but that an impression will be created in the mind of the customer that will be well worth the effort.

Of course, the Schoolmaster is glad to get drawings, no matter whether they are made in this way or whether they are made in pencil on a piece of wrapping paper. The Schoolmaster is always ready to give his comments and criticisms on drawings sent in, no matter how they are drawn. It is the Schoolmaster's ambition to help whenever he can and the man who does not have time or facilities for handing in a carefully worked out plumbing drawing is urged to send in a drawing made in whatever way he chooses. It is hoped, however, that a great many drawings will be sent in good enough to impress the most exacting home owner.

Every reader is urged to take part in these plumbing conferences. All that is necessary is to send in a solution of a problem, a question, a comment or a discussion of a problem.

No one should hestitate to send in a plumbing solution because he cannot draw well, for each drawing sent in must be redrawn in India ink so that it can be made into a zinc etching for printing. The ability to make good plumbing layouts is, however, a factor of increasing importance toward success in the plumbing business.

Each drawing, solution, question, comment or discussion should bear the name and address of the sender and date of the issue in which the problem appeared.

Initials only or an identifying name will be used in connection with the publication of a drawing or letter if requested.

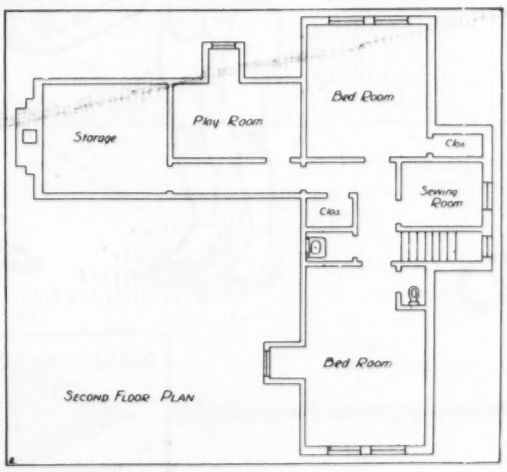
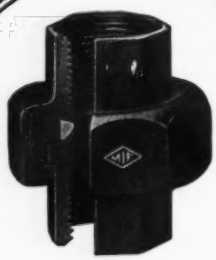
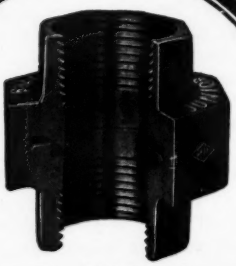


Fig. 2.—Second floor plan

BRANFORD UNIONS



Branford
350 Pounds

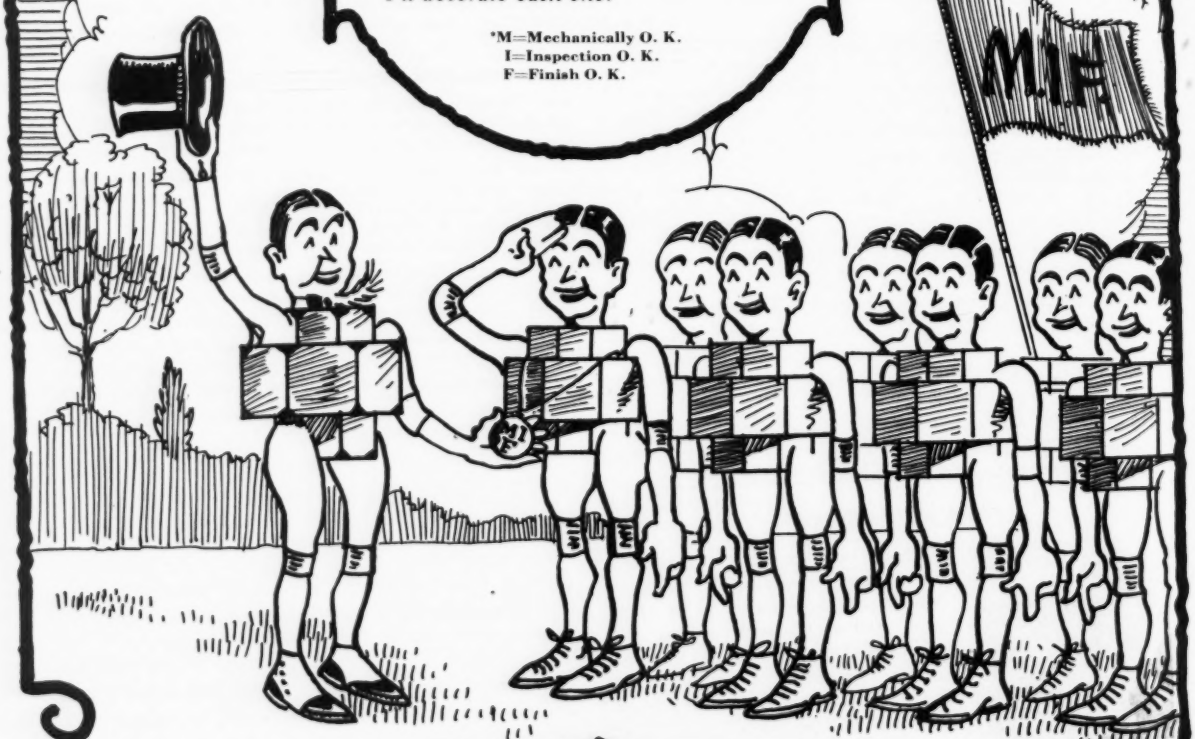


Branford Junior
250 Pounds

Consistently Good

Old Man Branford Union
Held a grand Union review
Of all the Branford Unions
Shining bright and new.
He said, "The M.I.F. award*
I'll pin upon the best,
Of course, not until after
I have made a rigid test."
He searched the ranks, but after while
Said, "It cannot be done,
You're all so perfect and alike,
I'll decorate each one."

*M=Mechanically O. K.
I=Inspection O. K.
F=Finish O. K.



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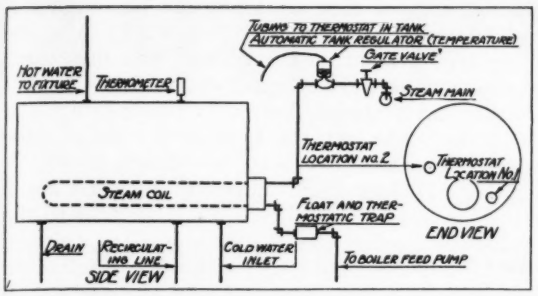


Fig. 1.—General piping scheme showing side view and end view of boiler. The location of the thermostatic connection was the cause of failure of the tank regulator

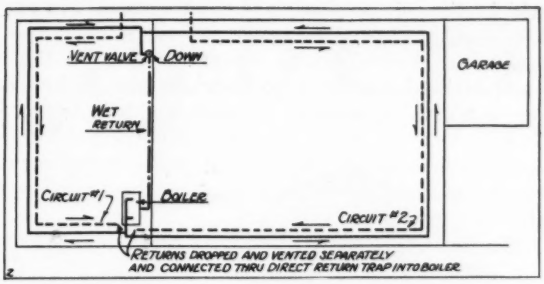


Fig. 2.—Piping layout of a thermostatic trap job having the returns reversed. The complaint was that the heating of the end radiators on circuit No. 2 was not reliable

More Heating Troubles

By R. L. ANTRUM

SOME time ago, while calling on an architect, he asked whether I had five or six hours to spare to look over a job which had just been completed and on which trouble was reported.

Feeling in need of a little outing, we jumped into the car and drove to a nearby city to investigate the complaint, and if possible, overcome it. Before leaving, an appointment was made with the contractor to meet us at the building at 1:00 p. m.

Arriving on the job, as scheduled, we found that the complaint registered by the operating engineer was that the automatic tank regulator refused to regulate. The general piping scheme seemed to be in accordance with good practice and is shown in Fig. 1.

The tank regulator was of nationally known manufacture and of the self operating or self contained type. That is, the regulator was of all metal construction, having a thermostatic bulb projecting into the tank, the bulb containing a sensitive fluid which generates pressure due to the heat of liquid in contact with it.

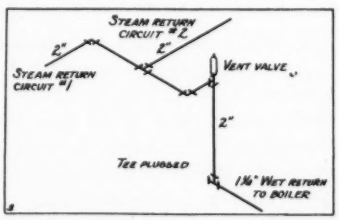


Fig. 3.—Detail of connection of returns in piping layout shown in Fig. 2. Steam from shorter circuit closed air valve before steam filled longer circuit

This pressure is communicated through a flexible connecting tube to the bonnets of the valve. The bonnet is equipped with a metal diaphragm or bellows which responds to pressure changes by opening or closing the valve so as to maintain the desired water temperature.

The tank being up rather high, it was decided that a closer inspection of its regulator connections would be in order. Looking at the end of the storage tank we noticed that the tank manufacturer had provided two possible openings for the thermostatic bulb—see end vein Fig. 1. One of these openings (thermostatic location No. 1) was slightly below the top of the heating surface, and the other, (thermostatic location No. 2) was about 4 inches above the heating surface.

Furthermore the contractor had used opening No. 1 which caused all of the trouble. The water around the thermostat, when in opening No. 1, was really dead, that is, it did not circulate with sufficient rapidity to give the valve a chance to work. All of the more rapid circulation of water in a tank of this kind is always above the steam coils, so that the thermostat was changed to location No. 2.

In order to test out the advice it was decided to change the location immediately. It may be interesting to know how this was done without draining the tank.

The steps taken were as follows:—

1. The hot water supply line was turned off.
2. The cold water supply was turned off.
3. The recirculating line was turned off.

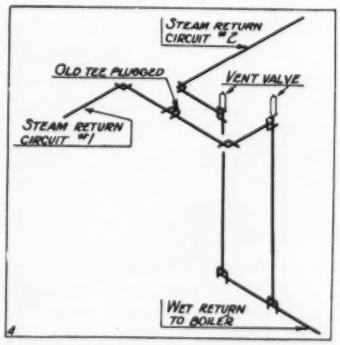


Fig. 4.—Correct connection of return shown in Fig. 2. Note that there is a separate air vent valve for each return

4. The drain line to sewer was opened.

By opening the drain under the above conditions a vacuum was created on the top of the tank which permitted taking out the thermostat and replacing with a plug without danger.

Additional water was let out creating more vacuum

which allowed the placing of the thermostat in opening No. 2.

While sitting down to wait for action on the revamped hook-up the contractor wanted to know if we would mind looking at another job in which he was having a little trouble. Knowing that we couldn't find out anything definite about the regulator for several hours, we rode to the contractor's shop to look at his system.

The layout is shown in Fig. 2 and consisted of a

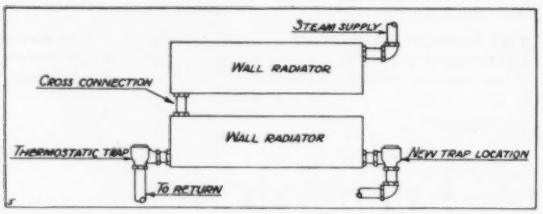


Fig. 5.—Illustration of a garage radiator which would not heat all of the radiator. Condition was effectively remedied when thermostatic trap was changed to end of radiator opposite point of steam entry

thermostatic trap job having the returns reversed. His complaint was that the radiators on the last part of circuit No. 2 would heat at times and at other times it would not. Inspection of the piping around the boiler showed that good practice had been followed as far as the piping was concerned. Also the venting arrangement on the returns, and the return trap connections were satisfactory.

Further investigation however, showed that the ends of the steam returns from both circuits were connected together, overhead, as shown in Fig. 3. Circuit No. 1 being much shorter than circuit No. 2 resulted in steam from circuit No. 1 getting to the air valve and closing it before the steam had a chance to fill circuit No. 2. This, of course, resulted in erratic results. The suggested changes are shown in Fig. 4 and when made remedied the trouble.

Then there was a further complaint that a two tiered wall radiator in the garage would not heat entirely. The radiator was connected as shown in Fig. 5. Inspection at once showed that the way the two tiers were connected was the cause of the trouble. That is, the cross connection with the return, as shown, short circuited a great deal of the heating surface. By changing the radiator trap to the opposite end of the radiator this complaint was also cured.

Several hours having passed, we returned to the school where the engineer reported that the valve was working satisfactory, and it is still working fine, even though it has been in service for several years.

Architects' Filing System Explained

Subscribers' Question Answered for Catalog Index

ONE of our subscribers recently wrote us and asked for information relative to the filing system of the American Institute of Architects stating that all catalogs and circulars from the manufacturers, coming into their office, have printed on them their indexes for filing purposes, but that he has no knowledge of the filing system. Undoubtedly, this condition is not uncommon among the contractors and we are glad that our attention has been called to it. The item involved is as follows:

There are forty major divisions made on the subject of buildings and each one has its own number. These are such as 1.—Preparation of Site; 7.—Waterproofing and Damp-proofing; 29.—Plumbing; 30.—Heating and Ventilating; 32.—Refrigeration; and 40.—Regulations.

Each major division is subdivided as to the various subjects which come under its heading. In the case of 30.—Heating and Ventilating, there are such subdivisions as 30a.—General Design; 30c.—Steam and Water; 30d.—Ventilating; 30h.—Boiler Paint and Painting; and 30i.—Ash Collection and Removal.

The second subdivision of the major division, which is a division of the first division of the major division, may be illustrated by the division of the subject of 30c.—Steam and Water. In this case there is 30c1.—Boilers; 30c2.—Pipe, Valves, Fittings, etc.; 30c3.—Regulators; 30c4.—Radiation; and 30c5.—Pumps.

The last division in the system is a subdivision of the second division of the major division. In other words, this is a third subdivision of the major headings and an illustration is taken under the heading 30c2.—Pipes, Valves, Fittings, etc.; where we see 30c21.—Pipe Hangers; 30c22.—Expansion Devices; 30c23.—Traps; and 30c25.—Hot Water Equipment.

Example Used in Explanation of System

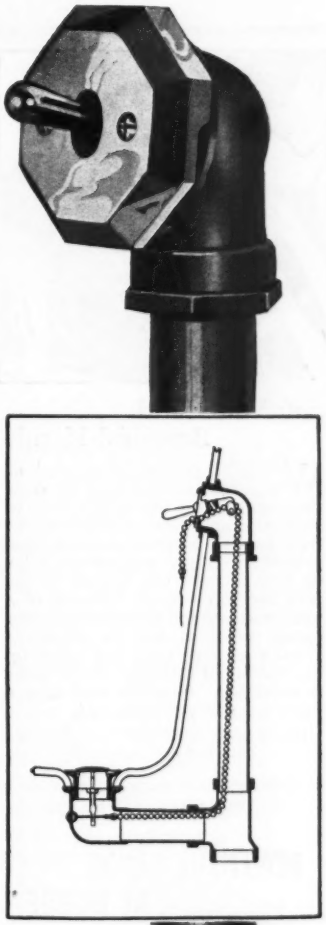
As an example, suppose you were to receive a catalog marked, A. I. A. File No. 29h32. The first number, 29, indicates that it is to be filed under the major division, Plumbing. The letter, h, tells that it is to be placed under the subdivision, marked 29h.—Plumbing Fixtures. The number 3 indicates that it is to be placed under the second subdivision marked 29h3. Showers, Stalls, and Accessories. The last number, 2, places the catalog among those entitled "Stalls and Doors," or under the heading 29h32.—Stalls and Doors.

An outline of the subdivisions under the major subject of refrigeration is as follows:

32. Refrigeration.
- 32a. General Design.
- 32b. Piping.
- 32c. Refrigerators.
  - 32c1. Doors.
  - 32c2. Iced Type.
  - 32c3. Automatic Type.
    - 32c31. Refrigerating Units.
- 32d. Ice Water Systems.

390 Plumbers

Placed their stamp of approval on this new Mechanical Bath Waste



Leaders in the plumbing industry—delegates to the Buffalo convention of the National Association—came and saw and approved our new mechanical bath waste when exhibited for the first time.

Individuals and groups of men from all over the country literally "tore it apart" to discover its merits. And when they got through they praised it highly—said it was the best and most practical waste they ever saw. Foolproof—easy to install—sanitary. They liked the fact that there was nothing back of the tub to give trouble.

It has minimum waterway restrictions—no dirt or hair catchers. When the pop-up is open, the chain rests snugly against the top of the waste tube.

No seats to become pitted and water cut. The seat and plug are in the waste outlet. The ball joint head fits the slope of any tub and the overflow ell is held to the tub by a lock nut. Brass friction rings provided at every joint insure permanent tightness. Stopper is easily removed by simply lifting out plug.

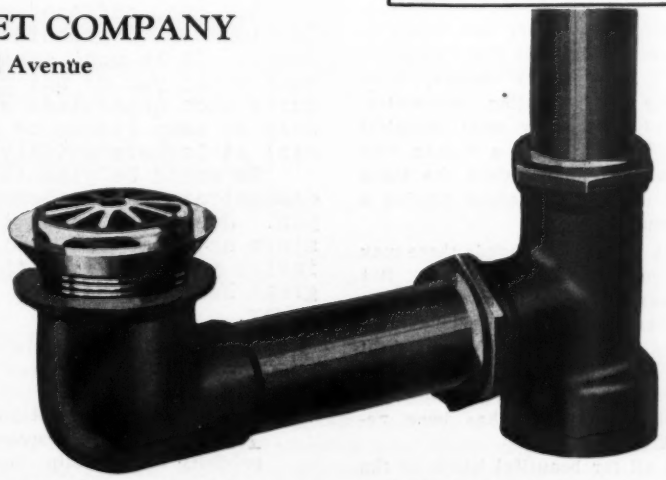
Wouldn't you, too, like to have further details of a waste that was endorsed by 390 of the most successful plumbers in the country?

Write for instruction sheet showing simplicity of construction and ease of installation.

The CHICAGO FAUCET COMPANY
2700-22 N. Crawford Avenue
CHICAGO

Made in two styles—Art Chrome octagonal design, as illustrated; also in round pattern. One size, 1½ in. male or female.

This completes the most attractive bath combination on the market. An automatic diverting fixture, foolproof and troubleproof—a wonderful shower head, and now a unique mechanical waste. It's worth looking into.



CHICAGO FAUCETS

RETAIL ADVERTISING SERVICE

Here is copy for two newspaper advertisements and a sales letter which our readers are free to use without charge. The cuts, if you want them, are sent you for twelve weeks—two new cuts every other week—for $4.20.

Soft Water and Beautiful Hands

WOMEN pay a great deal of attention to the kind of soaps they use—and it would pay them to study the water into which they put their hands. Nothing is so pleasing as beautiful hands; and nothing helps to keep smooth the texture of the skin like soft water. The use of a water softener will not only keep your hands young—it will cut down the amount of soap used and speed up the household tasks for which water is necessary. Come in and have a water softener demonstrated.

(In this space your Name, Telephone Number and Address)

NEWSPAPER AD No. 32

BEAUTIFUL HANDS AT BRIDGE

"I know that every one wants to have good hands when they're playing bridge," says Harry Brown, local plumbing and heating contractor. "Not only that, they want beautiful hands. I don't blame a woman who has beautiful hands when she takes a great deal of time about playing a good hand.

"Back of beautiful hands there may be, of course, a beauty expert. But there ought also to be a water softener. Hard water plays the deuce with sensitive skins—and while one might forgive a beautiful partner for a misplay, she will get no mercy if the hand that plays the hand has been neglected.

"I'm all for beautiful hands at the bridge table—and I'm doing my best to help the good cause along by providing a water softener that will—but, there—I was talking about beautiful hands, not about business."

SALES LETTER No. 15

HARRY BROWN

PLUMBING & HEATING

Two Rivers, N. Y.
July 27, 1929

Mrs. Edward Jones,
Two Rivers, N. Y.

Dear Madam:

You admire beautiful hands. Every women does—every man does.

In a woman's hands, beauty depends largely upon the texture of the skin. Beauty experts give a great deal of attention to the problem of keeping the skin young, pliant, smooth.

The first step in the process, it seems to us, is a study of the water used for household purposes. You know how soft and caressing rain water feels to the skin.

It is possible to have water of equal softness with a (Insert name of softener you handle) Water Softener. It takes our city water, treats it, and delivers it to the faucet with all the gracious velvety quality of rain water.

Besides, softened water lightens the household tasks. It is much easier to work with; you do not require such quantities of soap or soap flakes or powder; it lathers quickly.

We would be glad to demonstrate our softener for you. Just drop in at the store any time and familiarize yourself with this great help to the home maker.

Very truly yours,
HARRY BROWN.

AT LEFT and right you will find newspaper publicity items. Clip them and hand one each week to your local paper. Get your name in the news columns as well as the advertising columns.

Summer Care of Heating Plants

WINTER operation of heating plants depends, in a large measure, on the care given them during the summer. If your heating plant has not been inspected since it was shut down, we suggest our special inspection service. Just phone us and ask to be placed on our growing list for this inspection service. The charge is nominal (here insert flat charge for inspection.) A telephone call will bring a competent man—to assure you of heating comfort next winter.

(In this space your Name, Telephone Number and Address)

NEWSPAPER AD No. 33

THE HEATING PLANT HAS A BEAUTY NAP

"Bears, we are told," says Harry Brown, "take a beauty nap all winter long. Heating plants get their beauty nap in the summer time. The only difficulty is that heating plants—like bears—wake up in an ugly mood sometimes.

"I've never met a bear that had just awakened from his winter's sleep—but I've struggled with plenty of heating plants which refused to answer the first call in the fall without grousing about it.

"That needn't be the case. A little care during the summer—it ought to be given just after the heating plant has been shut down for the warm weather—will assure the home owner that his plant will function cheerfully right from the start. A neglected heating plant is worthless when the cold weather comes along, if what were small troubles are aggravated by forcing the plant to warm the house."

Copy for an Educational Leaflet

Beautiful Hands Need Soft Water

Copy A

(In this space your Name, Telephone Number and Address)

AT the left we show layout for one of the educational leaflets in the series being published on this page. The copy is below. All you have to do is show copy and give the cut to your local printer—he can make it up in just the size shown, to be kept in your sales room and enclosed in letters. The copy can be used on a blotter, also. (35c for the cut.)

Copy "A"
for the Educational Leaflet

Beautiful Hands Need Soft Water

THE care of the skin should commence with some knowledge of the kind of water used for household purposes. Beautiful skin will deteriorate where hard water is used, not only because of the quality of the water, but because of the greater need for soap.

The difference most quickly noted between hard water and soft water is that the former will not produce "suds" as quickly or as profusely as the soft water. So that, when soft water is used in the home, no matter what the purpose, a smaller amount of soap will be found necessary. Thus the skin is not subjected to irritation from this source.

The modern water softener takes the city water and treats it chemically so that it is delivered to the faucet soft, ready to do a much easier and better job than hard water.

We invite you cordially to come into our store for a demonstration of the (here insert name of water softener you handle) Water Softener. No obligation whatever—we'd just like to be able to demonstrate the difference in the quality between hard and soft water.

Copy for a Statement Enclosure

(To be set up by your printer just as shown here and sent with statements of overdue accounts)

The Use of Credit

OUR national Department of Commerce has just issued a report made after a study of credit conditions among the retailers of a certain type—not plumbing and heating contractors—in a large city. And the principal reason given for failures among these retailers is unsound credit extension.

We are interested in the subject, not only as retailers, but because we form a part of the buying public—and it is the buying public which pays for business failures. You and I carry the burden for every business failure in our communities.

Here's how it works: We will say that a retailer fails and that his creditors can collect only one-fifth of a total indebtedness of $25,000. That means that there is a balance of $20,000 worth of goods which were sold to the retailer for which his creditors cannot collect.

Obviously, no business can absorb such losses. What happens? When the financial statement of these companies is made up, they find that credit losses amount to a certain percentage of their cost of doing business. They can only add that percentage to the cost of making their merchandise, and you, and we, as members of the buying public, pay the price of that failure.

We are deeply in sympathy with the government's idea that credit extension must be placed on a sound basis, and that credit terms must be understood between the parties and observed on both sides. It will help make the cost of living for all of us that much lower.

QUESTIONS

ASKED BY READERS AND ANSWERED BY EXPERTS

How Water Is Raised in Skyscrapers

Editor, DOMESTIC ENGINEERING:—I would like to get some information about centrifugal pumps.

Supposing you had 50 lbs. pressure in a street main and a water tank on the 14th floor of a skyscraper, a height of 140 ft., the 50 lbs. pressure would carry the water only 115 ft. of that distance. Would a centrifugal pump boost the water the additional 25 ft.?

Massachusetts. Q. J.

The pump would raise the water the entire distance of 140 ft., as the force of the water entering the pump could not be utilized beyond the pump, but would merely maintain the supply to the pump.

In high buildings, it is the usual practice to use the city pressure of 50 to 75 lbs. to supply the fixtures in the lower 4 to 10 floors (this part of the system being up-feed); then a tank is installed at about the 18th floor and the intervening floors are supplied from this tank on the down-feed plan, and this scheme is continued on up to the top of the building.

The Bending of Brass Pipe

Editor, DOMESTIC ENGINEERING:—Kindly give me some information about the bending of brass pipe, so that I may be able to make good bends without damaging the pipe.

Illinois. G. S.

The following information from a man of experience will be of value not only to G. S. but to all those who are interested in bending brass pipe and tubing:

"I have seen much brass pipe bending, and have bent a great deal of it myself, and, with the exception of tubing of large size, have never seen anything but heat and sand used for bending it.

"With Boston as the center, Massachusetts 25 years ago was a brass pipe state, and that is where I got the brass pipe experience of which I am writing you.

"On tank-under-the-roof pressure jobs, we used ⅞-inch and ¾-inch tubing. On direct pressures we used iron pipe sizes, and while some few plumbers were able to bend the smaller iron pipe sizes without the use of sand, this was the material generally used, and by using the flame of two good furnaces, we had no trouble bending brass pipe as large as 2-inch.

"Here is the way we did it: Drive a wooden plug into one end of the pipe, not too hard, and fill same with dry plasterer's sand, and with a narrow piece of board hit the pipe quick taps until the sand is well packed in. Then ram a paper wad into the other end of the pipe, to keep the sand from shifting and leaking out.

"To bend the pipe thus prepared, it is held over the flame of a gasoline furnace until the flower or blush shows on it. Do not get the pipe any hotter than this, or there will be danger of burning and destroying it. To bend a pipe before it blushes usually means a flat or shapeless bend, and to bend with a greater heat usually means a broken pipe.

"To avoid stretching, the beginning of a 90-degree bend on ¾-inch or ½-inch pipe should be made by bending it in three different places, with a distance of about 1½ inches between them, and this is easily done by shifting the flame that much. If half the bend is made in this way, the rest of it can be done in one pull, without damage to the pipe.

To place a couple of bends on a brass pipe on measured centers is usually hard to do for a beginner, and to place a pipe with the bends made in the wrong place is no fun. This difficulty can be overcome by a little checking up on a practice bend. By ascertaining the difference, if you have any, between the center of your mark and that of the finished bend, you will know accurately how to place the bends as measured.

"With a plumber's understanding of heat, and by employing the right methods, brass pipe bending and installation is fairly fast work, and no more difficult than any other part of our doings."

The above comes from one of our friends who signs himself "Subscriber," Denver, Colorado. We appreciate the interest that prompts the sending of this piece of practical information.

How to Figure Consumption in Heating by Gas

Editor, DOMESTIC ENGINEERING:—No doubt you are aware of the fact that there is a great deal of interest shown these days in gas-fired boilers, and the way to figure the heating of a building by gas.

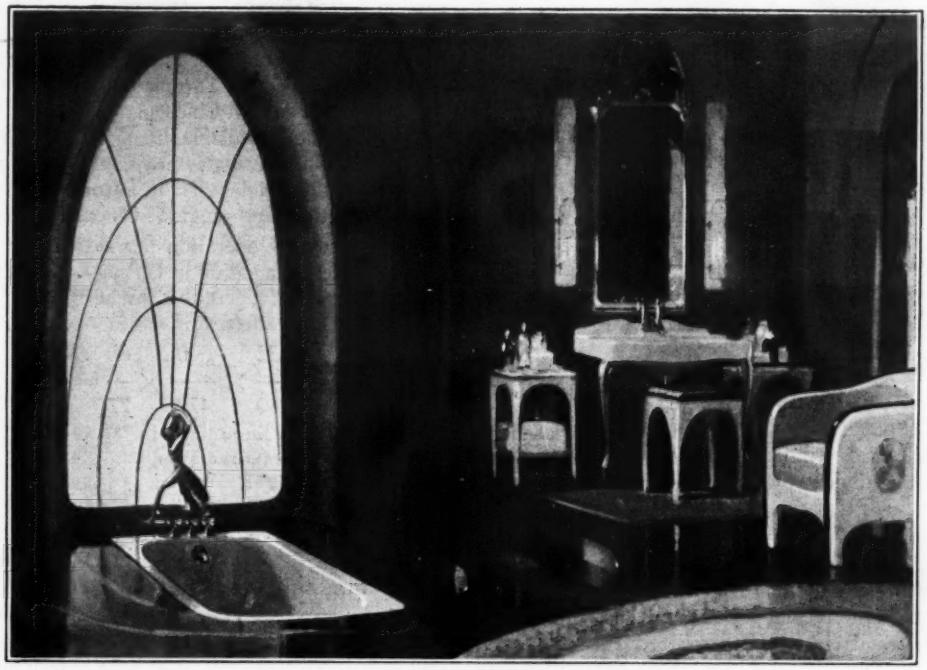
In this connection I have been up against one or two problems, and have been asked to tender on heating jobs giving the approximate cost of heating a building where gas is to be used as fuel.

I am sending you a summary of four jobs on which I would like your opinion. I have figured the radiation after the Mills rule, and find that the amount of radiation required in each job is as follows:

No. 1 Job—Store. Steam radiation..... 603 sq. ft.
No. 2 Job—Store. Steam radiation.....1,181 sq. ft.
No. 3 Job—Residence. Hot water radiation.1,065 sq. ft.
No. 4 Job—Residence. Hot water radiation. 773 sq. ft.

Can you give me an idea as to how many cubic feet of gas, 470 B.t.u., will be required in each case?

The temperature drops as low as 10 degrees below zero once in a while; the average for 242 heating days is 40 degrees. The gas of course is artificial, and the cost is 80c per thousand. I am not concerned about the



STYLE - BEAUTY - CHARMING EFFECTS - RESULT IN BATHROOMS USING "Standard" COLORS

Color in plumbing fixtures has brought a new idea of the possibilities for greater beauty in a well-planned home.

Color is interesting and satisfies the desire for greater charm in decoration.

The nine exclusive "Standard" colors have been selected by experts as those which are correct to combine with the greatest number of delightful color schemes. They permit even the most inexpensive type bathroom to assume a more interesting and colorful place in the home.

Ivoire de Medici

Rose du Barry

Orchid of Vincennes

Clair de Lune Blue

Ming Green

St. Porchaire Brown

Royal Copenhagen Blue

T'ang Red

Ionian Black

The wide showing of these colors in the fixture displays—both of styled and regular design—in "Standard" and Wholesalers' Showrooms allow your customers to gain adequate conception of the beauty of a colored fixture.

Or arrange to show several of the popular "Standard" colors and fixtures in your own Showroom, and better assure customer confidence in the installations you furnish and recommend.

Standard Sanitary Mfg. Co.
PITTSBURGH

"Standard"
PLUMBING FIXTURES

cash cost as much as the method you would adopt in arriving at the amount of gas to be used to heat the above buildings with gas.

Toronto, Ontario. N. E.

Relative to the question, "What method would you adopt in arriving at the amount of gas to be used in each of the above buildings?" we would say that it is figured that 240 B.t.u. are equivalent to one square foot of steam radiation, and that 150 B.t.u. are equivalent to one square foot of hot water radiation. This gives the following results:

Job No. 1—Store. Steam radiation—
603 (sq. ft.) × 240 B.t.u. = 144,720 B.t.u.

Job No. 2—Store. Steam radiation—
1,181 × 240 = 283,440.

Job No. 3—Residence. Hot water radiation—
1,065 × 150 = 159,750.

Job No. 4—Residence. Hot water radiation—
773 × 150 = 115,950.

For 470 B.t.u. gas, the number of cubic feet of gas required in each space will be the number of B.t.u. for the individual space, divided by 470. These figures are based on the assumption that the radiation is figured from zero to 70 degrees, making a temperature difference of 70 degrees.

The following calculations give the cost of heating the four jobs in Toronto and indicate the method used in obtaining same. It is noted that the conversion factor for the unit cost of operation per season per square foot of steam radiation, which changes the Chicago rating of $0.80 to a new rating based on Toronto conditions, is $1.37. The same conversion factor is used in changing the $0.50 rating for hot water radiation in Chicago.

The following values used in determining the conversion factor show a greater number of degree days in Toronto than in Chicago in addition to a fewer number of B.t.u. in Toronto gas and a higher cost for it.

7,732 degree days in Toronto
6,240 degree days in Chicago
470 net B.t.u. available in cu. ft. of Toronto gas
500 net B.t.u. available in cu. ft. of Chicago gas
$0.80 per thousand cu. ft. of Toronto gas average
$0.77 per thousand cu. ft. of Chicago gas average

Estimated cost of operation per season per square foot of steam radiation in Chicago..... $0.80

Estimated cost of operation per season per square foot of water radiation in Chicago..... .50

$$\frac{7732}{6240} \times \frac{500}{470} \times \frac{80}{77} = 1.37$$

603 sq. ft. of steam radiation	×	$0.80 × 1.37	=	$ 660.00
1,181 sq. ft. of steam radiation	×	.80 × 1.37	=	1,300.00
1,065 sq. ft. of water radiation	×	.50 × 1.37	=	730.00
773 sq. ft. of water radiation	×	.50 × 1.37	=	530.00

These figures were based on the assumption that the radiation was figured from zero to 70 degrees, making a temperature difference of 70 degrees.

The values $0.80 and $0.50, listed as Chicago cost of operation per season per square foot of respective steam and hot water radiation have been determined by actual experience and test.

KENNEDY
Malleable Iron Fittings

WHEN you figure your next job, remember that even though Kennedy Malleable Iron Pipe Fittings may cost a fraction of a cent more than the cheapest fittings, thousands of plumbers have found that they save many dollars of pipe-fitting time by protecting against imperfect threads, leaky connections, and split fittings.

THE KENNEDY VALVE MFG. CO., ELMIRA, N.Y.
New York Philadelphia Cleveland Atlanta
Chicago El Paso Salt Lake City Los Angeles
San Francisco Seattle

KENNEDY
VALVES-PIPE FITTINGS-FIRE HYDRANTS

Legal Questionnaire

(Continued from Page 83)

I might add this rather more definite statement of the sub-contractor's rights; and even this statement will start with an "if" because I do not know the facts: If the sub-contractor, under his contract and the contract between the general contractor and the owner and the contract between the owner and the finance house, had a right to demand payment from the finance house of the money certified to by the general contractor, at the time it was so certified, it is probable, and of course speaking very generally, that the owner would not have a right to require the finance house to pay that money to another person and the finance house would be liable to the sub-contractor if it did so, regardless of the lapse of several months. To put it another way: If the finance house was under a legal obligation on January 1st to pay the sub-contractor upon the certification of the general contractor, the owner could not on January 2nd or any subsequent date, change that obligation without the consent of the sub-contractor. Whether or not the finance house was under such a legal obligation, depends upon the contracts of the parties involved, and not merely upon the fact that such a certification was made.

Perhaps it may make the situation slightly clearer, if I use another and simpler example. Suppose that the general contractor had gone to his bank and had arranged for the bank to make payments to sub-contractors upon his orders. Suppose, further, that the general contractor had made no mention of this arrangement in his contract with his sub-contractors, and they knew nothing about it. Then, suppose that the general contractor gave his bank an order to pay a certain sub-contractor a certain amount of money, but, before the bank had made such a payment, countermanded the order. Under such circumstances the sub-contractor would have no right against the bank for not making payment to him. On the contrary, if the sub-contractor had provided in his contract with the general contractor that he would enter into the contract provided that the general contractor would certify to the bank to make certain payments, and the general contractor had so certified, and the bank had been a party to the contract in some form, the sub-contractor could hold the bank to payment.

I might add, in closing, that it is very probable that the sub-contractor has a right of action against the finance house under the terms of the various agreements which covered the situation.

Lienor's Right to Lien for Work Begun Before Mortgage on Property Is Recorded

Editor, DOMESTIC ENGINEERING:—The hotel building here was owned by a man who had a mortgage against the building of $4,000. The local banker loaned another man to buy an option on the building, and eventually had to take over the building. The banker then placed a mortgage on the building for $8,000, half of which was used to take up the $4,000 mortgage.

My labor on the building started when the man who bought the option took possession and continued for a

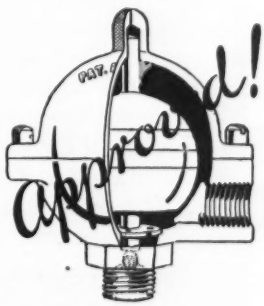
5 times as fast!

Beside the banks of a frozen winter stream, the man on snowshoes plods along. On the ice a skater whizzes by 5 times as fast.

Keep this 5-to-1 ratio in mind; it illustrates the comparative rate of pressure increase to temperature increase in closed domestic hot water supply systems. It pays the plumbing and heating contractor to remember this.

Provide sure relief with a Red Top

"Closed" domestic hot water supply systems can be made proof against skyrocketing pressures by the installation of a Red Top Relief Valve, Model No. 1. This valve, which may be set to relieve at 50, 75, 100 and 130 lbs. works automatically, being opened by pressure in the system, and closed by the force of gravity. It provides positive proof against explosions.



Sectional View, Model No. 1, for domestic hot water supply systems

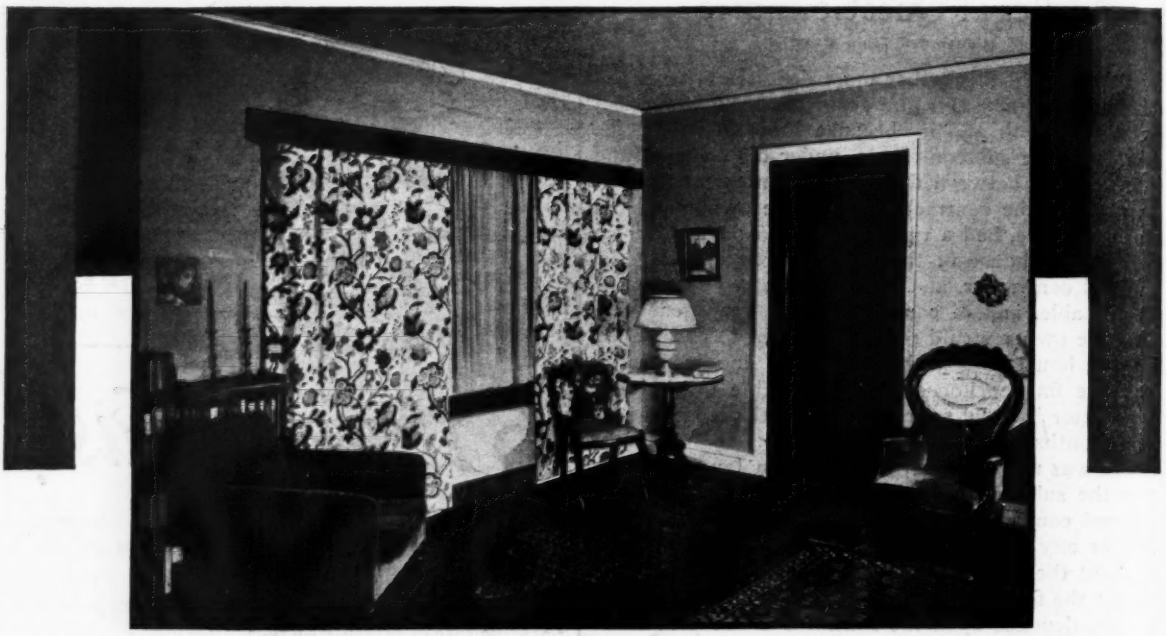
Model No. 1. bears the approval of the Underwriters' Laboratories, Inc., as does also the Red Top Model No. 2, relieving at 30 lbs. and forming the basis of an efficient pressure system of hot water heating.

Neptune Meter Co.
50 E. 42nd St. New York, N. Y.
Branch Offices in Principal Cities

Red Top Relief Valve

NEPTUNE METER CO. D.E.7-27-29
50 East 42nd Street, New York, N. Y.
Please send me a copy of the new edition of your folder, "Protection," which describes Red Top Relief Valves and their operation.

Name.....
Street.....
City.....
State.....



The new science in heating...
which embodies beauty and economy

The tremendous advantages of Trane Concealed Heating are apparent at once. The complete absence of clumsy radiators meets with immediate approval of decorators and owners alike. Closer inspection of a Trane Concealed Heater installation reveals a scientifically engineered job. It has been achieved by balance in engineering design and construction of the various parts, such as the heating element, adjustable steel stack, grilles and fittings. The result is a ruggedly built unit giving maximum efficiency.

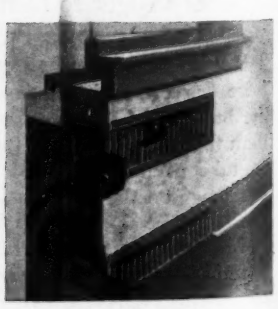
The cost of Trane Concealed Heaters is no greater than that of ordinary cast iron radiation equipped with high grade metal covers. Heating is more efficient because of the scientific distribution of warm air in the rooms—installation is simpler due to the extreme light weight of the units which are completely assembled at the factory — there are no extras. Accessibility is provided through the lower grille permitting complete removal of unit without disturbing the wall.

In addition to the Concealed Heaters, Trane makes everything necessary for a complete system (with the exception of the boiler and piping) including Trane Specialties such as the Bellows Valves and Traps. The valves are positively sealed by the bellows against leakage; no packing is necessary. A complete Trane System is guaranteed to give utmost heating satisfaction. Our new booklet describes the specialties as well as the Trane Vapor Heating System. Mail the coupon.

The Trane Bellows Packless Valve.

The Trane Bellows Trap

HEAT CABINETS **TRANE** CONCEALED HEATERS
PUMPS, UNIT HEATERS AND HEATING SPECIALTIES



period of about eighteen months. I filed a lien a few days after my last work. This work was done at the banker's direction and with his knowledge.

I asked the banker for settlement about the time he was getting the $8,000 loan, and he stalled, saying that he was selling and would pay when the deal was completed; but in reality at that time he was getting the loan.

The mortgage of $8,000 was placed on file before my lien was filed, but my first labor was done before the $4,000 mortgage was released. Does my lien come before or after the $8,000 mortgage?

Nebraska. G. P. B.

Answer:—Although there are many facts missing from your statement which I should have to know, before I could give you a definite answer, I should say that you have a valid lien, provided that you have taken the proper steps and continue to press your rights, observing all the very technical points which are involved in perfecting a lien right.

In the first place, your statutes provide that any person who shall perform any labor or furnish any materials for the erection, improvement or reparation of any house, building, appurtenance, etc., by virtue of a contract or agreement, express or implied, with the owner thereof or his agents, shall have a lien, etc.

From the facts which you state I cannot tell whether you had an agreement with the person owning the property or his agents, but I shall assume that you did have such an agreement.

Your court cases have held that liens may have priority over previous mortgage, if the mortgagee by agreement becomes promoter of the improvements. These cases also hold that mechanic's liens are prior to lien of mortgage if the work was commenced before the mortgage was recorded; and that a tenant cannot make leased premises liable to lien without authority from the owner, but that acknowledgment of the debt by the landlord subjects the property to the lien.

It would therefore appear that if you had a contract with the owner of the real estate, and particularly if the banker directed you to do the work, as you state, you have a lien right. If you had a contract with the owner of the building for your work, then it would also appear that you have a good lien, even though the mortgage was recorded before your notice of lien was filed, for you had begun your work prior to the time when the mortgage was recorded.

It is well to remember, when you state that the work which you did covered a period of eighteen months, that the work must have been done under one contract. In other words, if you, from time to time, went on the premises to make repairs under different orders for different work, and it was not work done under one contract, your lien would probably not cover the entire work which you did, for each alteration and repair job might be considered as a separate contract. In such latter case, your lien would cover only such work as came within the time limit for a single contract, with regard to the time when you filed your claim of lien.

As usual, in all such cases of lien rights, I very strongly urge you to consult a lawyer. Your case in particular has many angles to it which appear to require the service of a lawyer if your interests are to be protected.

"THE LEAD RING IS THE THING"
The American Ground Joint Waste Connection
with LEAD RING
Lead Ground Joint Ring
(Brass Ring if preferred)
saves time, money and grief. Assures a perfectly tight joint, as the Lead Ring sets easily to tubing and casting.
Male and Female furnished.
AMERICAN SANITARY MFG. CO.
ABINGDON : : ILLINOIS
No. 752 Male Thread

B&G
Outside Type
WATER HEATER
for Steam or Vapor Heating Boilers
The only Indirect Heater having removable coils without disconnecting pipes.
Ask your Wholesaler or write us for details.
BELL & GOSSETT COMPANY
3000 Wallace St., Chicago, Ill.
2281 Scranton Road, Cleveland, Ohio
638 Caswell Block, Milwaukee, Wis.
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Determining Pipe Sizes

(Continued from Page 51)

Fig. 17, the temperature drop through Radiator 2 is from 186 degrees Fahr. to 169 degrees Fahr. or 17 degrees Fahr., whereas, with the use of the resistors, the temperature drop through the same radiator is from 195 degrees Fahr. to 158 degrees Fahr., or 27 degrees Fahr. as shown in Fig. 18.

Fig. 17 shows clearly that the average temperature of the water in the radiators of a one-pipe system decreases as the distance of the radiator from the heater increases. Consequently, to secure a correct installation it is necessary to base the size of the radiator not only upon the number of B.t.u. which the radiator is to dissipate, but also on the average temperature of the water in the radiator.

For the installation described herein, the main was not covered because it was felt that in most residences it is desirable to have the basement heated by the main and without the installation of basement radiators. When the basement need not be heated, the main should be covered to reduce the cooling of the water before it reaches the radiators.

A one-pipe system should be designed so that the drop in temperature through the system will be as small as practicable. This can be accomplished, in part, by using a large main and by covering the main.

The operation of the one-pipe system is so simple and so positive that it is comparatively easy to design and to install such a system, and it seems that it

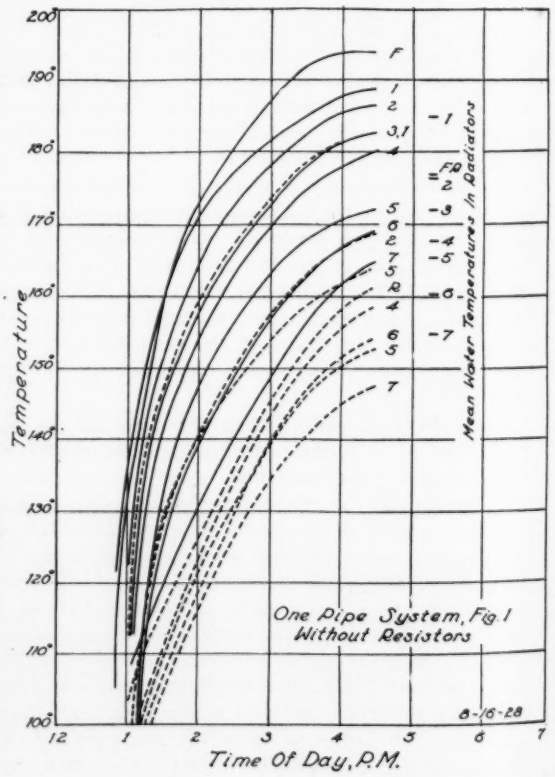

Fig. 17.—Record of a typical run for the one-pipe system without resistors

should be possible to prepare tables according to which pipe sizes and radiators can be determined with sufficient accuracy.

The following sets of tables and rules are proposed for this purpose.

Table 1 is based on a temperature drop of 35 degrees Fahr. through the system. Table 2 is based on a temperature drop of 25 degrees Fahr.

Both tables are based on a head of 3 feet, 6 inches;

Table 1. Capacities in 1,000 B.t.u. of Mains for One-Pipe Systems for a Temperature Drop of 35 Deg. and a Head of 3 Ft. 6 Ins.*

Length of Horizontal Mains	Pipe Sizes—Inches							
	1¼	2	2½	3	3½	4	5	6
50	37	68	98	171	245	327	580	888
75	32	59	87	151	222	298	527	818
100	28	53	79	138	204	278	487	774
125	26	48	73	129	191	261	460	736
150	23	45	68	121	179	245	437	700
175	22	42	65	114	169	231	415	670
200	21	40	61	107	158	216	394	638
225	20	38	58	101	149	203	374	608
250	19	36	55	95	140	190	354	580

* If the head is more than 3 ft. 6 in., the values given in this table may be increased.

i. e., on a vertical distance of 3 feet, 6 inches from the main to the center of the heater. If the distance is greater, the system will function better than indicated by the tables.

Both tables are based on the assumption that the main is covered. If the main is bare, the farther radiators will not be as efficient as the tables imply.

For both tables, the friction head calculations were based on the "Length of the Horizontal Main," listed in the tables, plus 10 feet of pipe and 10 elbow equivalents for risers and connections. These additions were assumed to be representative of the ordinary installations.

A comparison of Table 1 with Table 2 shows that the size of the main must be increased as the temperature drop through the system is decreased. For example, for a system delivering 200,000 B.t.u., with a length of horizontal pipe of 150 feet, a 4 inch main is required if the temperature drop is to be 35 degrees Fahr. and a 5 inch main, if the temperature drop is to be 25 degrees Fahr.

It will be shown below that, as the size of the main increases, the average size of the radiator decreases, thereby offsetting the increased cost of the main and conserving floor space.

Table 3 shows the capacities of risers for first, second, and third floor radiators. The table is based on the assumptions that the vertical distance of the first floor above the main is about 20 inches, that the story heights are about 9 feet, that the individual resistances in every radiator circuit are approximately equivalent to 14 elbows, and that the temperature drop through each radiator will be 20 degrees Fahr. or less.

Tables showing the capacities of risers supplying more than one radiator can be prepared but it is considered best not to propose such tables until after

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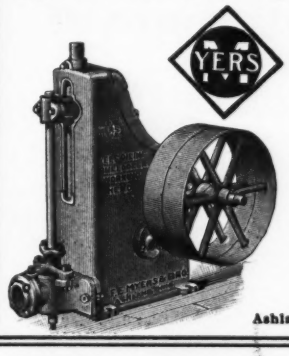

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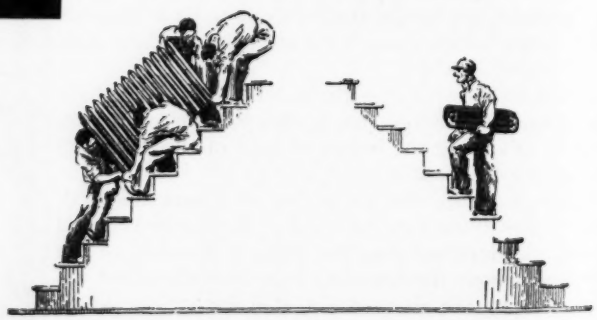

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corresponding installations shall have been made and tested.

Rules for Determining Sizes for Radiators for One-Pipe Systems

The correct method of finding the sizes of radiators for one-pipe systems is to assume the total temperature drop through the system and, having done that, to calculate the successive partial drops in temperature which occur in the main at the several return risers. Knowing these partial temperature drops find, *first*, the temperature of the water in every flow riser, *second*, the average temperature of the water in the raidator, *third*, the value of *k* for the particular temperature difference—water to air,—and, *fourth*, the corresponding radiator size.

Using this method in designing a system in which there are 16 sets of risers, it will be necessary to make 16 sets of calculations. This method may be unnecessarily refined and it may be sufficiently accurate to use the following approximate method: Divide the system into four sections so that the radiators in each of the four sections deliver approximately the same quantity of heat to the building. Number the four sections consecutively in the order in which the water flows, so that Section 1 receives the hottest and Section 4 the coldest water. Calculate the sizes of the several radiators in the usual way and then multiply the calculated sizes by the factors shown in the following tabulation:

For a total temperature drop of	Section 1	Section 2	Section 3	Section 4
35 deg.	1.00	1.15	1.30	1.45
25 deg.	1.00	1.10	1.20	1.30

To illustrate the use of the tables and rules proposed above, let it be required to design the one-pipe system shown in Fig. 19.

There are 7 radiators delivering, together, 71,000 B.t.u. per hour.

The length of horizontal main is 160 feet.

Table 2. Capacities in 1,000 B.t.u. of mains for one-pipe systems for a drop in temperature of 25 deg. and a head of 3 ft. 6 in.*

Length of Horizontal Mains	Pipe Sizes—Inches						
	2	2½	3	3½	4	5	6
50	41	59	100	140	195	346	552
75	35	51	90	130	179	320	500
100	31	48	83	121	165	293	450
125	30	44	75	113	153	280	425
150	27	40	70	104	143	265	405
175	25	38	66	98	136	252	390
200	24	35	63	93	130	239	377
225	23	34	61	90	125	225	367
250	22	33	60	88	120	223	358

* If the head is more than 3 ft. 6 in., the values given in this table may be increased.

Let us adopt 25 degrees Fahr. as the total temperature drop.

To find the size of the main: from Table 2, a 3 inch pipe is slight too small and a 3½ inch pipe too large. We could construct the main partly of 3 inch and

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FIGURE 1062

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partly of 3½ inch pipe; or, if the main can be installed more than 3 feet, 6 inches above the the center of the heater, we could use a 3 inch pipe. It may be best to adopt the 3½ inch pipe in this case.

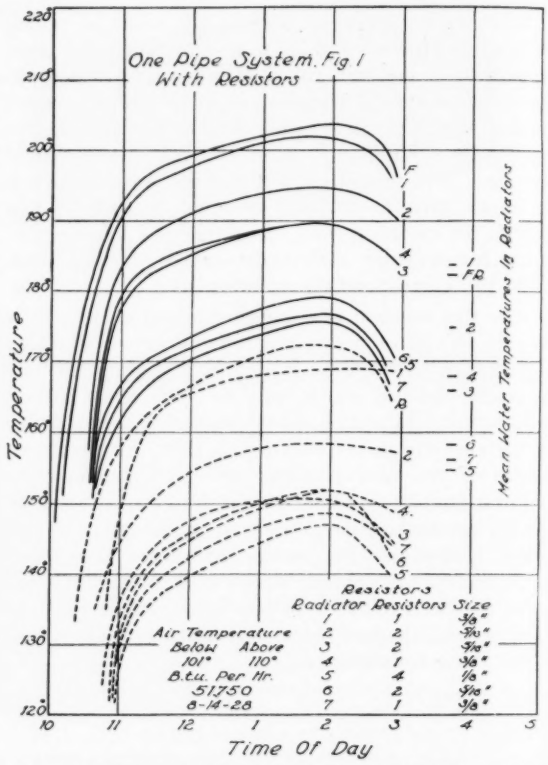


Fig. 18.—Record of a typical run for the one-pipe system when radiators were equipped with resistors

To find the sizes of the risers: from Table 3, the largest radiator, No. 7, having a heat output of 15,000 B.t.u. will need a 2 inch riser if located on the first floor, and 1¼ inch risers if located on the second or third floors. The smallest radiator, No. 6, having a heat output of 5,000 B.t.u., will need 1 inch risers if located on the first floor; and a ¾ inch riser if located on the second or third floor.

To find the sizes of the radiators: Let us assume that the water leaves the heater at a temperature of 210 degrees Fahr. when the system is delivering 71,000 B.t.u. and that the radiators are operating with a temperature drop of 20 degrees Fahr. The average water temperature in Radiator 1 will then be 200 degrees Fahr., and the temperature difference—water to air—will be 130 degrees Fahr. For this temperature difference, and for a 38 inch, 3 column radiator, the value of k is 1.36, and the heat transmission is 1.36 x 130, or 176.8 B.t.u. per square foot. Consequently, if all radiators receive water at the same temperature as Radiator 1, the radiator sizes would be as follows: No. 1, 28; No. 2, 57; No. 3, 54; No. 4, 71; No. 5, 79; No. 6, 28; and No. 7, 85 square feet.

To divide the heating system into four sections, so that each section delivers, approximately, the same quantity of heat; we would probably place Radiators 1 and 2 in Section 1, Radiators 3 and 4 in Section 2,

Radiators 5 and 6 in Section 3, and Radiator 7 in Section 4. Multiplying the radiator sizes calculated above by the factors shown under the rules for determining radiator sizes, namely: 1.00, 1.10, 1.20, and 1.30, when the total temperature drop is 25 degrees

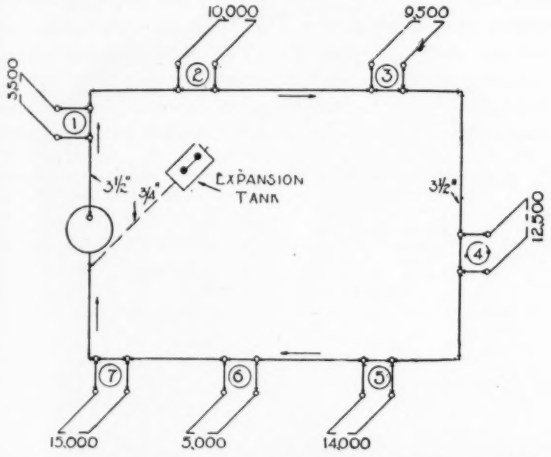


Fig. 19.—Design for a one-pipe system, according to tables and rules proposed herewith

Fahr., we find the following sizes: No. 1, 28; No. 2, 57; No. 3, 59; No. 4, 78; No. 5, 95; No. 6, 34; and No. 7, 110 square feet. These calculated sizes must be changed to the nearest stock sizes available.

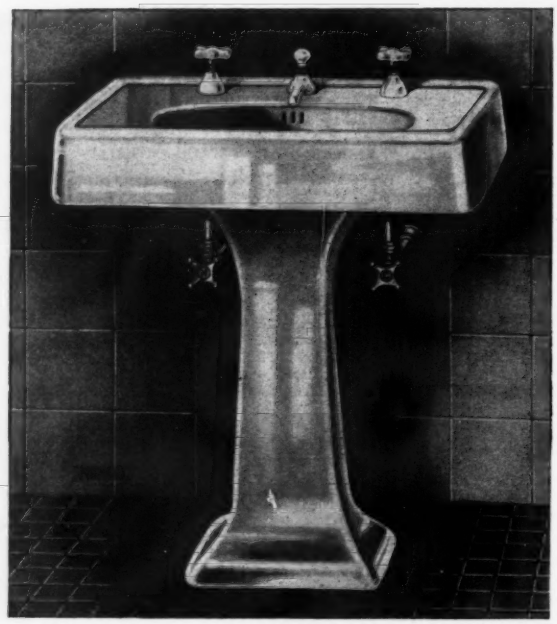
The third experimental installation was the two-pipe direct-return system shown in Fig. 2. Having had the experiences described above with the earlier installations, this system was designed so that the friction head in the risers of each radiator was equal to the pressure head produced by the radiator plus that portion of the pressure head, produced by the heater, which was available for the radiator at the riser connections to the mains. The friction head was provided partly by the pipe line and partly by orifice resistors in the radiator circuit. The resulting operation of the system was very satisfactory as may be seen from Fig. 20, which is a record of one of the experimental runs.

Table 3. Maximum capacities in B.t.u. of risers for one-pipe systems*

Size Inches	First Floor	Second Floor	Third Floor
¾	2,500	6,000	7,000
1	5,000	11,000	12,000
1¼	9,000	20,000	24,000
1½	12,000	.....	.....
2	21,000	.....	.....

* If valves are installed in the radiator circuits, they should be of the same size as the pipes. If smaller valves are used, they will introduce larger friction heads than were included in the calculations on which the table is based.

As a final test, the orifice resistors described in Fig. 20 were removed and the system allowed to operate without them. The results secured are shown in Fig. 21, which seems to illustrate very nicely what really happens when a system is said to be short-



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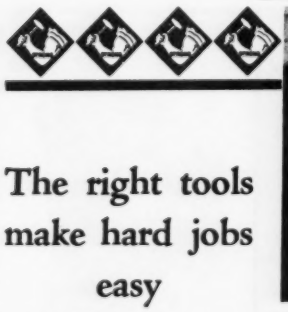

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circuiting and which proves conclusively that a system will not function correctly when the friction heads in some of the radiator circuits are too small.

In order to show how accurately a hot-water heating system can be designed, a careful check-calculation was made of the operation of the two-pipe direct-return system shown in Fig. 2, for the operating conditions shown in Fig. 20. The object of the check-calculation is to find whether or not the friction head for every radiator circuit is equal to the pressure head available for that radiator when the calcu-

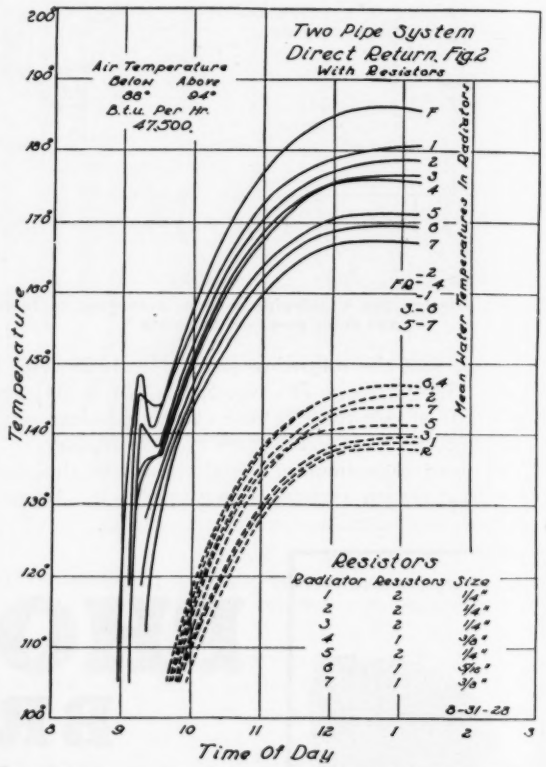

Fig. 20.—Record of a typical run for the two-pipe direct-return system when the radiators were equipped with proper resistors

lations are based on the actual conditions existing during the experimental run shown in Fig. 20.

The calculations are too complicated to be recorded here in detail. The general results for Radiator 1 are as follows:

Heater pressure head (Produced in main flow and return riser)	649 m. i.
Friction head in heater and in mains between heater and connections of risers of Radiator 1	95 m. i.
Remainder of heater pressure head, available to produce flow through Radiator	554 m. i.
Radiator pressure head (Produced in radiator flow and return riser)	410 m. i.
Total pressure head available for Radiator 1	964 m. i.
Friction head in radiator and in connected pipe lines	50 m. i.

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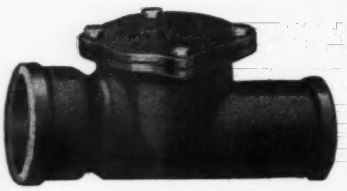

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Total friction head in radiator circuit 1,130 m. i.
Excess of calculated friction head over calculated pressure head, 1,130—964, or 166 m. i.
Per cent error: 166/964 or + 17 per cent.

Similar calculations were made for the other six radiators and the following general results were found:

Radiator	Calculated Pressure Head	Calculated Friction Head	Per cent Error
1	964	1,130	+17
2	835	920	+10
3	780	844	+ 8
4	590	515	—13
5	1,729	1,037	—40
6	1,322	1,214	— 8
7	379	375	— 1

It is evident from these check calculations that every radiator in the system is functioning as would be predicted from a correct design, except Radiator 5.

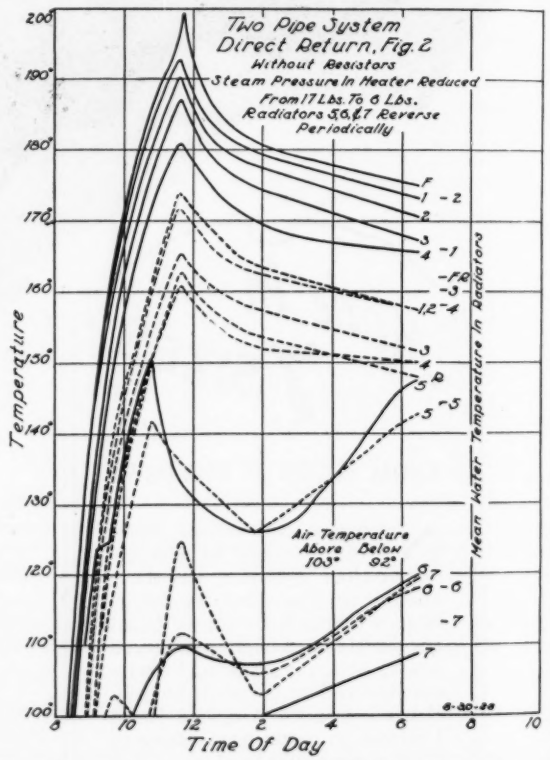


Fig. 21.—Record of a typical run for the two-pipe direct-return system after the resistors had been removed

The calculated friction head in the circuit of this radiator is about 692/1729, or 40 per cent smaller than the actual friction head. No explanation for this large discrepancy could be found unless it be that the velocity of the water in the flow riser is so low that the water in contact with the pipe cools sufficiently to reverse the direction of its flow along the outer portion of the stream, as sketched in Fig. 22. If such a condition should exist it might account for the high friction head which was found in the actual installation and it would suggest the existence, in the

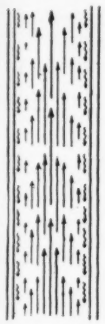


Fig. 22.—Possible double flow, caused by cooling during low velocities, in a flow riser, producing an excessive friction head

flow risers of hot-water heating systems, of a critical velocity below which the system will not function correctly.

The subject of a critical velocity in hot water heating pipes may be very important and well worth careful study as a separate research project, in connection with additional studies, similar to those described in this paper, which will be necessary before tables can be safely proposed that may be used in the design of two-pipe heating systems in the manner which was originally intended at the outset of this investigation.

In conclusion, the authors express their appreciation of the valuable assistance given them in this work by G. H. Glover and W. H. Badgett, seniors in Texas Agricultural and Mechanical College, especially in the preparation of diagrams and with the check-calculations.

Sprinkler System Operated by Clock

(Continued from Page 53)

method of supplying moisture to all forms of plant life is quite responsible for results far beyond the average experience, all of which is brought about as easily as one turns a single faucet in the home.

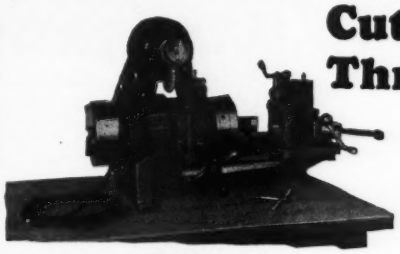
"The services of specialists in engineering and botany are necessary for the design and installation of a scientific system of landscape irrigation because the details of location, water supply, soil and various requirements of plants that are to go into the landscape, must be given equal consideration. It naturally follows that experts in plumbing, chemical and landscape engineering, as well as the plant physiologist must be engaged to work out the details of designing and execution of a plant of scientific landscape irrigation."

Opportunity for Master Plumber

In view of the fact that a system of piping is a large part of a scientific system of landscape irrigation, it is of course understood that the services of a master plumber are an integral part of the work. A wide awake plumber whose clientele includes owners of homes in better residential sections, should be very much interested in this comparatively new field.

The fact that the plumber is not organized to meet all the requirements of scientific landscape irrigation as outlined above, should not prevent his entering this field to expand his business as gradual development will provide opportunities of obtaining the necessary requirements to carry on the work.

Irrigation concerns are organized to provide complete service. The master plumber should immediately investigate the future possibilities of this business in his particular locality. It is the policy of these concerns to co-operate with the master plumber.



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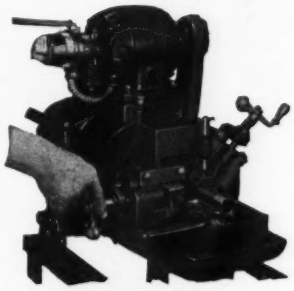
Cuts Pipe Threading Costs

A full-fledged Portable Pipe Machine for Reaming, Chamfering, Threading and Cutting Off pipe from ⅛" to 2".

Uses any standard make of solid square right or left hand pipe or bolt dies.

Weighs 250 pounds. Operates off either A. C. or D. C. lighting circuits. Is sufficiently powered to drive geared heads on the larger pipe, up to 6".

A real pipe machine at a price you can afford. Ask us about it today. Give us the name of your supply dealer.



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PEERLESS MACHINE CO. • **Racine, Wisconsin**

"CHICAGO"
Pipe Threading Machines Production Precision
Latest and Most Advanced Types on the Market
Chicago Pipethread Machine Co., Racine, Wisconsin
Offices and Factory: 1621 Racine Street

JOIN THE NO SAND—

HOLE IN ONE CLUB

BY BUYING YOUR

CAST PLUMBING SPECIALTIES

FROM

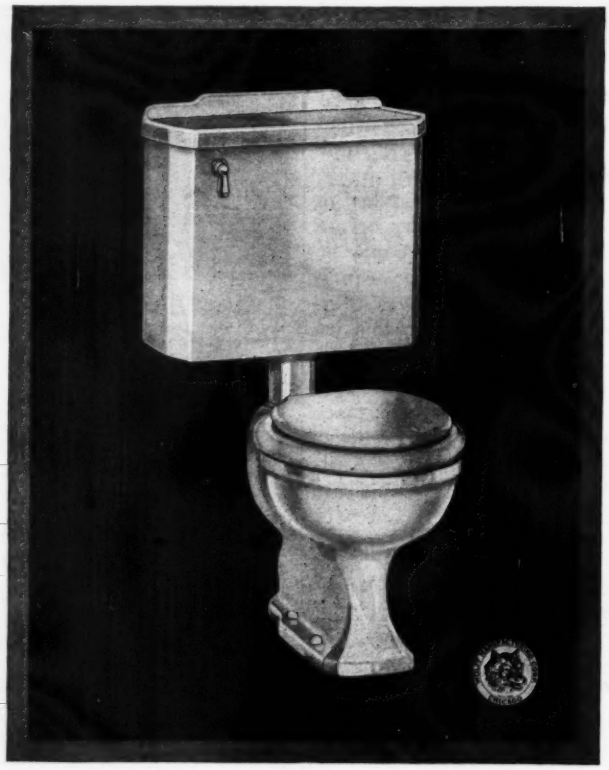
The RICHMOND FOUNDRY & MANUFACTURING CO Inc.

RICHMOND, VIRGINIA

GOLFERS NOTE!

We will give an attractive bronze souvenir to any plumbing or heating wholesaler, master plumber or active employee of either, making a legitimate "hole in one" during a golf game.

A Dependable Source of Supply



WOLFF

THE "SUPERIOR" SYPHON JET CLOSET has achieved an enviable reputation through many years of successful and satisfactory service in the better homes.

Its large water area, deep, sanitary seal, large syphon leg and powerful jet insures a strong and quiet flush action.

The new "SUPERIOR" Octagon Low Tank with its shelf lid in either White or Colored Vitreous China or Enameled Iron and Octagon Flush Casing makes a most attractive and desirable fixture.

The "WOLFF SUPERIOR" FLUSH VALVE can be substituted where a tank is not wanted.

SUPERIOR SYPHON JET CLOSET

The trimmings used in the SUPERIOR Tank are specially designed for it. The chain operated flush mechanism can be tripped both ways and will not stick or bind. The ball float valve is entirely enclosed and is fitted with union connection for instant removal if repairs ever become necessary. All fittings are finished in WOLFF "DUROCROME."

WOLFF CO.

"Superior Plumbing Fixtures"

CHICAGO

Branches and Distributors in all Principal Cities

SUPERIOR PLUMBING FIXTURES

SUPPLY NEWS

AMONG MANUFACTURERS, WHOLESALERS AND SALESMEN

American Radiator Acquires Campbell Metal Window Corp. Stock

American Radiator and Standard Sanitary Corp. has acquired all of the capital stock of Campbell Metal Window Corp., of New York and Baltimore. There will be no change in the manner of operation of Campbell Metal Window Corp. Its manufacturing operations will continue to be carried on as heretofore and its selling conducted through the existing sales organization, headed by Allston Sargent, who has been elected president of the company. A. C. Armstrong, of Baltimore, heretofore president of the company, has been elected chairman of the board.

◆

Fisher Governor Co. Purchase Apex Regulator Co.

The Fisher Governor Co. of Marshalltown, Iowa, announce that they have purchased the Apex Regulator Co. of Decatur, Ill. The Apex plant equipment will be moved to Marshalltown, but the plant will be operated as an entirely separate unit. A. W. Cash, founder of the Apex Co., will act as engineer and general superintendent of the Apex plant.

◆

Dimock and Fink Co. to Open New Branch

Dimock & Fink Co., 220 East 125th street, New York City, will open on August 1 a new branch house in Nyack, N. Y. This, it is reported, will be the first plumbing and heating wholesale house in Rockland County, N. Y. The new branch will be located on Franklin street and will carry plumbing and heating supplies. The establishment consists of a two-story and basement warehouse, 85 ft. by 100 ft., situated on a railroad siding, together with pipe yards, etc. Warren F. Ward, formerly with Molby Boiler Co., will be manager of this branch.

◆

Electrol, Inc., Announce Staff Changes

Leod D. Becker, former owner and publisher of "Fuel Oil Journal," has disposed of his publishing interests, and has been elected president of Electrol, Inc., St. Louis, Mo. The executive office will be moved at once to New York City. Other changes in the staff of the company include: W. T. Koken, retiring president, becomes chairman of the board; M. E. Simpson, formerly general manager of the Electrol Distributing Corp., now merged with Electrol, Inc., becomes vice president in charge of sales; Lionel L. Jacobs continues as vice president and general manager of the company. Han A. Kunitz, formerly technologist of the American Oil Burner Association, has been appointed chief of research engineering, in charge of research and development. Lewis L. Scott, inventor of the original Electrol burner, who is a vice president, continues as general consultant on patents and engineering. The officers, with W. L. Bechtold, of G. H. Walker & Co., St. Louis investment bankers, and W. R. Bush, New York capitalist, constitute the directorate.

The new executive and sales offices will occupy an entire floor of the building at 227 East 45th street, New York. The factory will remain at St. Louis.

◆

Charles Cory and Son Acquire Tucker Foundry Co.

The Tucker Foundry Co., manufacturers of soil pipe and fittings, Medina, N. Y., has been sold to the Charles Cory and Son, Inc., of New York City, and it is announced that the new concern will add considerably to the force now employed. The new owners will take possession on August 1, and it is understood that it will increase the production of the foundry. The foundry was originally built by the late Albert L. Swett. It was later taken over by the Central Foundry Co. and three years ago the buildings and equipment were sold to the Medina interests and became the Tucker Foundry Co.

◆

Opens Massillon Branch with Striking Newspaper Broadsides

Heralded by striking broadsides of full-page, half-page and numerous quarter-page advertisements in the local newspaper, the opening of the Massillon branch of the Hardware and Supply Co. of Akron, Ohio, was

The new Massillon, Ohio, branch of the Hardware and Supply Co. of Akron, Ohio. Above, inset, Fielding L. Huesmann, Massillon branch manager

announced to the people of that thriving Buckeye city recently, the displays featuring a large picture of the building selected to be the headquarters of the new branch, a portrait of the new branch manager, Fielding L. Huesmann, and effective presentation of outstanding lines of supplies handled.

◆

Ohio Heater Co. Opens Three New Branches

The Ohio Heater Co. of Columbus, Ohio, has opened up branch offices in Dayton, Ohio, Toledo, Ohio, and Chicago, Ill. There will be a display and warehouse stock in connection with all three offices. A. F. Thumb, formerly connected with the Dayton Building Trades, will have charge of the Dayton office, which will be located at 7 Mutual Home building. J. W. Shirley will be in charge of the Toledo office, which will be located at 1950 Vermont avenue. Frank Seifert, formerly manager of the Peerless Illinois Co., will have charge of the Chicago office, located at 453 West Erie street.

◆

Injured in Airplane Crash

Robert F. Prox, vice president of the Frank Prox Co., Terre Haute, Ind., recently suffered from an airplane accident which occurred recently near Lebanon, Ind. Mr. Prox, who is an aviation enthusiast, and owns his own private monoplane, left Terre Haute early the morning of the accident, and while flying through heavy fog, and unable to see the ground, flew into it, and wrecked the airplane. Mr. Prox was seriously injured, but is expected to recover. He is at present at the St. Vincent hospital, Indianapolis, Ind., where a leg was amputated above the knee July 13, on account of infection setting in, the ankle being badly crushed. A cast was removed from his left hip on July 19.

Robert F. Prox

◆

Open New Plant in Louisville

A new plant of the Linde Air Products Co., located at 2603 Floyd street, Louisville, Ky., started producing oxygen recently. Mr. Frye is superintendent of the new plant, and W. L. Potts, whose headquarters are at the Cincinnati plant, is district superintendent.

◆

Prest-O-Lite Co. Opens Two New Plants

The Prest-O-Lite Co. announces the opening of two new acetylene gas plants, at Wichita, Kans., and Youngstown, Ohio. H. Wilson and W. Webert are respectively superintendent of the Wichita plant, and district superintendent, the latter with headquarters at the North Kansas City plant. A. C. Mattison is the superintendent of the Youngstown plant, while C. G. Holt is district superintendent, with headquarters at the Pittsburgh plant. Both plants will supply local industries with dissolved acetylene for oxy-acetylene welding and cutting.

◆

Hardinge Brothers, Inc., Announce New Chicago Distributor

Frank L. Bates, Inc., has just been appointed Chicago distributors for Hardinge Brothers, Inc., and several new showrooms and service stations will be opened in various parts of the city. Frank L. Bates, Inc., main offices, sales and service headquarters, are located at 62 East Lake street.

◆

A. M. Byers Announce New York City Changes

The New York City offices of the A. M. Byers Co., Pittsburgh, Pa., have been moved from suite 917 to suite 1208, Bowery Savings Bank Building, 110 East 42nd street. George W. Hamill is manager of the Metropolitan New York territory and Henry L. Chute, assistant manager. The balance of the sales personnel includes Robert W. Law who has the Brooklyn and Long Island territory, Lee Turner who has the New Jersey area adjacent to New York, and Fletcher Collins who is a special representative of the company.

◆

Stringer Brothers to Have New Plant Manager

Stringer Brothers Co., Inc., of Chicago, Ill., announce that W. H. Watt, a well-known manufacturing and mining expert of New York City, has been chosen as manager of its plant at Gadsden, Ala. Mr. Watts succeeds F. J. Wineman, who after an extended service at Gadsden will hereafter be located at Chicago, continuing his duties as treasurer of the company.

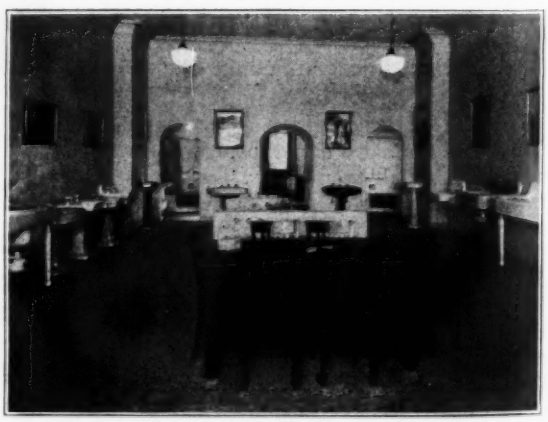
Mr. Watt, during the past three years, has been identified with the American Radiator Co., prior to which he was connected with the Richmond Radiator Co.

◆

Kohler Co. Remodels Showroom at Omaha, Neb.

Two complete bathrooms, with fixtures and walls done in lavender and green and blue and ivory, respectively, are striking features of a most attractive showroom, newly remodeled, which has just been opened to the public by the Kohler Co. at 1907 Farnam street, Omaha, Neb.

A wall from floor to ceiling two-thirds of the way



Remodeled show room at Omaha

back in the showroom furnishes an area in front for the display of Kohler baths, lavatories, sinks and fittings. Three arches are cut through this wall, those on the left and right giving access to a small and a large model bathroom, respectively, and that in the center leading into an office that extends across the entire width of the showroom, back of the bathrooms.

A secondary arch at the left in the entrance way into the office gives access to a special closet display room.

Formal announcement of the opening of the remodeled showroom was received recently by a large number of plumbers, jobbers and architects in the Omaha territory. J. C. Worscheck is in charge.

◆

Hold Anniversary Exhibit

Tomlinson Co., Inc., as a means of commemorating the twenty-seventh anniversary of its existence, held an exhibit of plumbing and heating materials during the week of June 24 at its headquarters branch, Tenth street and Erie avenue, Philadelphia, Pa. Two new exhibit rooms that were opened are to remain a permanent part of the firm's business. One of these on the second floor of the building is given over to lower priced plumbing fixtures while the one on the street floor presents examples of high grade bathtubs, lavatories, sinks, seats, shower curtains, bowls, tanks, etc. Both exhibit rooms are finished in cream with apple green trimmings. Colored earthen and enameled ware are most in evidence. In the ground floor room of some thirty pieces shown there are but six in white. Fixtures are well arranged about the walls while in the center are paneled compartments in which are displayed built-in tubs. Bath, shower, lavatory and sink fittings of newest design are also a part of the display.

◆

Blake Specialty Co. Announces New District Sales Manager

Blake Specialty Co. of Rock Island, Ill., announce the following additions to their sales' staff: John Mason, Jr., of Houston, Tex., who will cover Louisiana and Arkansas; J. R. Pulsifer, of Rochester, N. Y., northern New York State; Marcus T. Donahue of University City, Mo., the territory of St. Louis and vicinity; and Allen D. Wright of Detroit, Mich., who will cover the state of Michigan.

◆

Crest Mfg. Co. Announces Sales Staff Additions

The Crest Mfg. Co. of New York City, announces that "Jack" N. Bullard, formerly Westchester sales representative for Pierce, Butler and Pierce, has resigned from that connection and will hereafter represent the Crest company in that section as district sales manager; that Philip Rappaport of Baltimore will be its Baltimore and Washington sales representative; that V. G. Collins of Webster Groves, Mo., has been appointed manager of sales for Missouri and Illinois territory, marking the third state beyond the Mississippi to be covered by the organization, as it celebrates its second anniversary.

All Lead-Copper-Galvanized Iron

SIMPLEX AND JUNIOR FLASHINGS FOR EVERY ROOF CAN BE HAD IN EACH OF THE ABOVE METALS.

Write for prices and full information on the easily installed, durable SIMPLEX and JUNIOR Flashings.

SIMPLEX MFG. CO.
2644 N. Ashland Avenue
Chicago, Illinois

"Junior Flashings"

FLAGG FITTINGS

FF

FLAGG FITTINGS have been manufactured for three generations. They have gradually grown in popularity until today FLAGG FITTINGS are used in all sections of the world.

FF

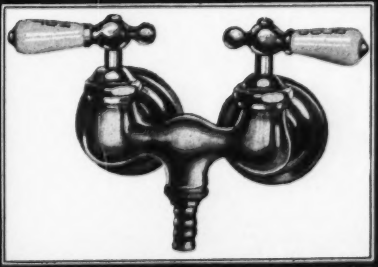
STANLEY G. FLAGG & CO., Inc.
1421 Chestnut St.
Philadelphia, Pa.

DART UNIONS

Dart Unions for all piping work, large or small jobs, give to the customer something not included in your bid—long life.

E. M. DART MANUFACTURING COMPANY
PROVIDENCE, RHODE ISLAND
The Fairbanks Co., Sales Agents
Canadian Factory, Dart Union, Limited, Toronto

Ask your jobber

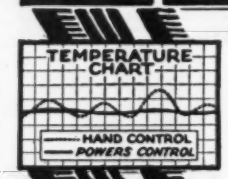


BATH WISE FAUCETS

PLUMBERS QUALITY BRASS GOODS

J.B.WISE, INC. SINCE 1877 WATERTOWN, N.Y.

Temperature Control



Most Complete Line Made

THERMOSTATIC Regulators for Hot Water Heaters; also scald proof Mixing Valves for individual showers, group showers, baby baths, etc.

Write for Bulletin No. 2035

2716 Greenview Ave., CHICAGO
Offices in 36 Cities

The POWERS REGULATOR COMPANY

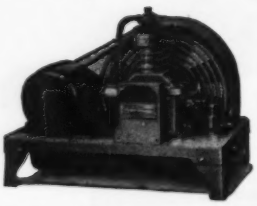
Dole

Automatic All Metal *Non-Adjustable Thermostatic*

SYPHON AIR VALVES

The Dole Valve Company, 1913-33 Carroll Ave., Chicago

EFFICIENT



An Electric Refrigeration Unit is judged by the quick-cooling efficiency it develops and the economy it shows on operating costs. With these main points in mind compare

TRUPAR
ELECTRIC REFRIGERATION

with any other make and note its superior performance. Sold through the trade and a consistent money-maker for the trade. Write now for Trupar proposition.

Residence Models Apartment Models Commercial Installations

TRUPAR MFG. CO. 140 Davis Avenue Dayton, Ohio

INSTALL THE REPUBLIC INTEGRAL STOP VALVE FOR GREATER CONVENIENCE

The REPUBLIC BRASS COMPANY
and its subsidiary GRABLER-REPUBLIC, *Inc.*
4900 EUCLID BUILDING · CLEVELAND, OHIO

Personal Mention

W. P. DAVENPORT, president of the Wm. H. Page Boiler Co., New York City, is at his summer home in Boothbay Harbor, Me. Mr. Davenport expects to be away until early fall.

W. D. MOORE, president of the American Cast Iron Pipe Co., Birmingham, Ala., has made a number of talks on the cast iron pipe industry at various meetings of Birmingham business men during the past several weeks.

C. S. COLEMAN has been made New York manager for the Stockham Pipe and Fittings Co., Birmingham, Ala. Mr. Coleman's experience with this concern dates back a number of years, and just prior to taking charge of the New York territory from its metropolitan headquarters, 88 Thirty-fifth street, Brooklyn, N. Y., he was manager of the local office at Birmingham.

Fred Scott

FRED SCOTT is now back with the Walworth Co., covering the city of Boston proper and Cambridge. Mr. Scott first entered the Walworth service as a boy, thirty-seven years ago, serving for sixteen consecutive years, before making a connection with the Grinnell Co. of Providence, R. I. Two years later he returned to the Walworth organization, remaining this time eleven years. The Johnson-Washburn Co. of Boston then secured his services as manager for the subsequent eight years, from which connection he has now withdrawn to come back to Walworth. His wide acquaintance and popularity with the trade is well known.

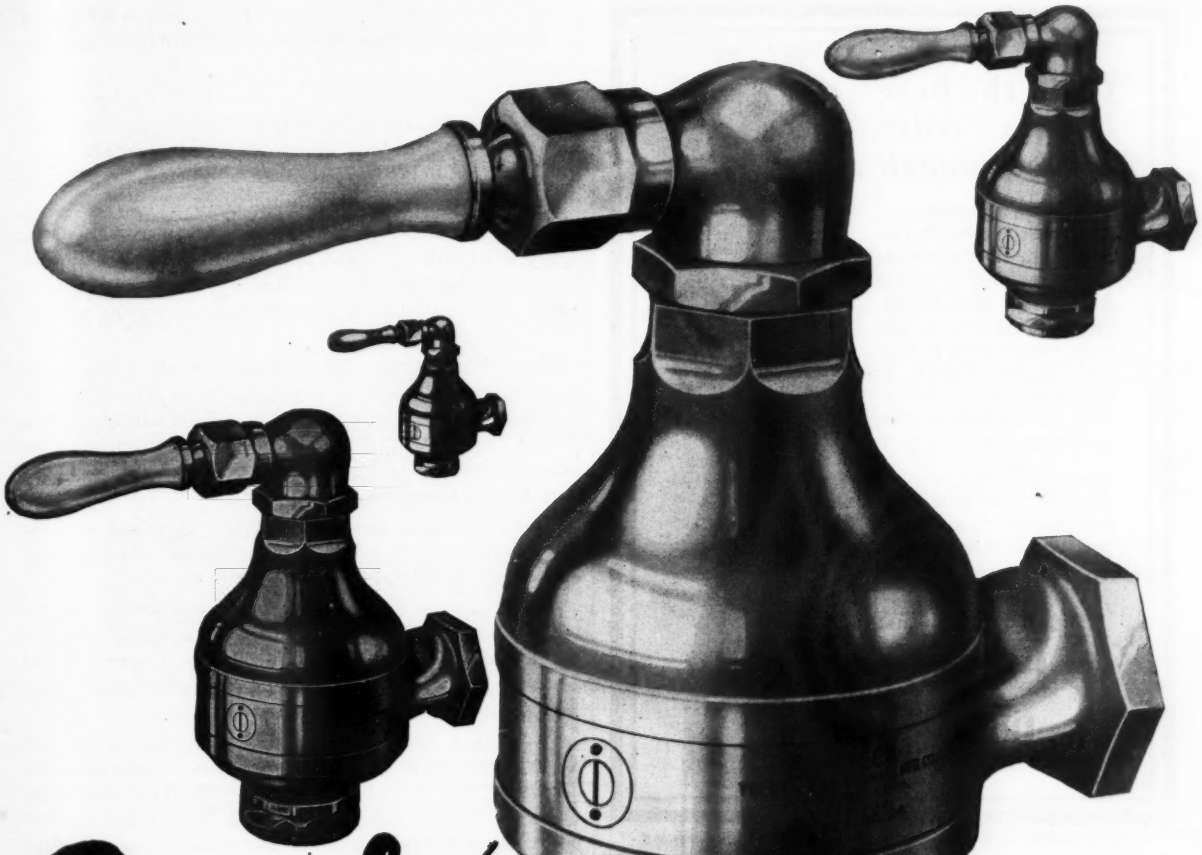
A. C. JONES, representative of the Sloan Valve Co. at St. Louis, Mo., has moved his headquarters from 1983 Railway Exchange Building to larger offices at 1622-23 Syndicate Trust building.

M. ALLEN FAUST, manufacturers' representative of Philadelphia, has recently taken on the line of the Belknap Mfg. Co., Bridgeport, Conn. Mr. Faust has been connected with the plumbing and heating industry for a great many years, and is well known in the Eastern part of the country.

CHARLES P. HACKETT, long associated with the boiler, radiator and heating industry, has been appointed representative of the heating department of the Hajoca Corp. for Philadelphia and surrounding territory.

WILLIAM M. COOPER, secretary of the New Jersey Chapter National Association of Plumbing and Heating Salesmen, has recently been put in charge of the Southern New Jersey Counties as sales representative of the Bryan Boiler Corp., Newark, N. J.

GUY LYNES, 1130 Piedmont avenue, Apartment 26, Atlanta, has been appointed district engineer of the Gasteam Heating Company, of Chicago, Mr. Lynes will have charge of the Atlanta territory. This com-



Simplex flush valves

SIMPLEX Flush Valves are ideal for public and semi-public buildings.

The four-way by-pass arrangement enables valves to be adjusted readily from the outside.

Handle may be adjusted and locked in any position desired.

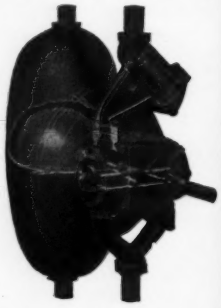
Ask your jobber to supply Simplex Flush Valves on the next job. You will see at once why they are superior.

The BEATON & CADWELL MFG. CO.

Established 1894

NEW BRITAIN, CONN.

Only the best Duplex Feeder is good enough



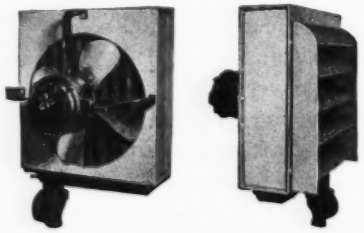
If a boiler is worth protecting it is worth the best form of protection. The new, Self-cleaning McDonnell and Miller Duplex Feeder is the only feeder with rotary self-cleaning valves, the only feeder with adjustable water levels and differential, the only feeder that is made to cope with *any* condition that can arise in service.

You build up customer good-will, escape service calls, and make more profit when you install this premier feeder. Of course you want a copy of the fact-filled 8-page booklet. Write

McDONNELL & MILLER
400 N. Michigan Blvd. - Chicago, Ill.

McDONNELL & MILLER
SELF-CLEANING
Duplex Feeder
"Doing one thing well"

KROY Unit Heater



KROY overhead Unit Heater incorporates the Super-Fin extended surface coil. It permits any steam pressure from 0 to 200 pounds. It can't leak—the joints are fused. A Kroy Unit delivers highest B. T. U. capacity at lowest B. T. U. cost. Write for ratings and specifications. Branch offices in important cities.

York Heating & Ventilating Corp'n
Largest Producers of Unit Heaters
1573 Sansom Street Philadelphia

pany also maintains district offices and warehouses in Tampa, Fla., Birmingham, Ala., and Jacksonville, Fla.

R. O. Housh, president of the May Co., Galesburg, Ill., returned to his desk on July 23 following a pleasure trip through Wisconsin with his wife and family. Mr. Housh stopped over a day in Chicago to visit with friends in the industry.

William Ball, president of the Kansas City, Mo., Master Plumbers' Association, was in Chicago recently, on his way home from a vacation in Minnesota. He has fully recovered from a recent serious illness.

Edward M. Robinson, president of the New Jersey chapter of the National Association of Plumbing and Heating Salesmen, has become connected with the Bryan Boiler Corp., Newark, N. J. Mr. Robinson is in the sales department and has been assigned to Essex, Union and Morris Counties in New Jersey.

Justin J. McCarthy has become identified with the Sheffler-Gross Co., Inc., Philadelphia, Pa., heating engineers, in the capacity of sales engineer.

A. F. Lake, for twenty years well-known in the wholesale heating and plumbing industry, has become identified with the Berryman System of Oil Heating, Inc., Chicago, as secretary and general superintendent.

Murray J. Millikin, recently associated in the sales department, with Hills-Stevens Co., manufacturers' agents of New York City, has joined the Thomson Meter Corp. of 50 East 42nd street, New York City, and will cover the Eastern section of the country for this firm.

◆

Play Two Courses at Canoe Brook

The second meet of the year of the Metropolitan Trade Golf Association was held June 20 at the Canoe Brook Country Club, Summit, N. J. This splendidly conditioned course, combined with the good weather that prevailed, afforded the twenty-two players who attended an unusual day of golf. Prizes were awarded for the best net score in Classes A and B over the 18 holes of the South Course in the morning, as well as over the 18 holes of the North Course in the afternoon. The players each had to play both courses.

Dinner was served at the conclusion of the day, during which prizes were awarded the following players: L. S. Rothwell, George Keenan, Thomas Liggett, Arthur Johnson, Maurice Ready, G. W. Hamill, James Weaver, Charles Wall, Fred Broatch, Harry Leach, Philip Platt, and Henry Letcher.

The scores were as follows:

	Morning			Afternoon		
	G.	H.	N.	G.	H.	N.
Platt	96	15	81	91	15	76
Wall	91	19	72	93	19	74
Letcher	116	40	76	No Card		
Ready	96	25	71	No Card		
Roberts	108	22	86	No Card		
Keenan	99	30	69	94	30	64
Leach	103	32	71	No Card		
Liggett	73	10	63	82	10	72
Weaver	98	21	77	88	21	67
Williams	115	38	77	No Card		
Hamill	93	40	53	No Card		
Rothwell	91	25	66	86	26	61
Broatch	93	20	73	No Card		
Johnson	81	10	71	81	10	71

Top row: Thos. O'Callaghan, Acme Heating & Ventilating Co., Boston; A. Blackhall of American Radiator Co., G. O'Callaghan, of Boston. Middle row: James Dwyer of Boston; Tom Swan of Hoffman Specialty Co., Boston; P. R. William and Charles Rose of H. L. Rose Co., Cambridge, Mass. Bottom row: Leon Graves, manager of American Radiator Corp.; Fuller Scofield and G. B. Ford of Richardson & Boynton Co. Photos taken at a recent meet of the Massachusetts Heating Trades Golf Association

New England Golfers Compete

The New England Metal Products Golf Association held a meet on June 27 at Wannamoisett Country Club. Despite the fact that the attendance was somewhat limited, the course was in good shape and the fair weather which prevailed afforded an excellent day. The next meet will probably be held during the week of July 22 at Crow Point Country Club. The following is a list of the players and their scores:

Morning

Name	G.	H.	N.	Name	G.	H.	N.
J. S. Nicholl	103	15	88	R. M. Greenlaw	91	12	79
W. J. Eddy	No. Card			E. D. Chesebro	99	18	81
R. Bontecou	106	15	91	G. L. Tillinghast	No Card		
J. E. Bradshaw	92	24	68	R. W. Hillman	No Card		
W. R. Weiss	131	33	98	H. C. Howard	Guest, No Card		
W. H. Taylor	99	18	81				

Afternoon

Name	G.	H.	N.	Name	G.	H.	N.
W. A. Griffith	99	27	72	J. E. Bradshaw	108	24	84
W. L. Adams	89	15	74	W. H. Taylor	99	18	81
R. Bontecou	108	15	93	R. M. Greenlaw	No Card		
F. A. Monroe	94	15	79	E. D. Chesebro	92	18	74
W. R. Weiss	128	33	95	R. W. Hillman	94	15	79
G. L. Tillinghast	138	39	99	H. C. Howard	105	Guest	
J. S. Nicholl	99	15	84	G. E. Phillips	121	30	91
W. J. Eddy	117	33	84	E. O. Chase	No Card		

◆

New Jersey Golfers Play in Heat

The June meet of the Plumbing and Heating Trades Golf Association of New Jersey was held at Braidburn Country Club, Madison, N. J., on June 18. In spite of the terrific heat, 40 members were in attendance.

At the dinner, the regrets of the president, Robert

Now! only $70

Cash, F.O.B. Factory For 210-gallon-per-hour size Complete with motor for 60 cycle or direct current

Profit by this outstanding value in Home Water Systems

AT $70, this New Type complete 210-gallon-per-hour Fairbanks-Morse Home Water System is unmistakably the greatest value ever offered.

It is automatic with all working parts enclosed in a handsome lacquered casing. This tremendous value, made possible by Fairbanks-Morse quantity production and world-wide distribution, will mean extra profits for the dealers that handle them.

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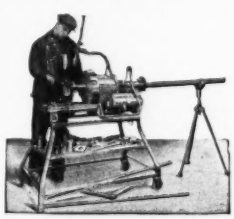

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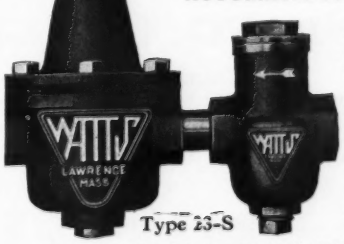

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Write for our discount sheet showing the Watts Line of Plumbing Specialties

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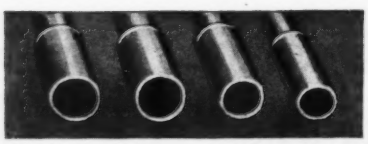

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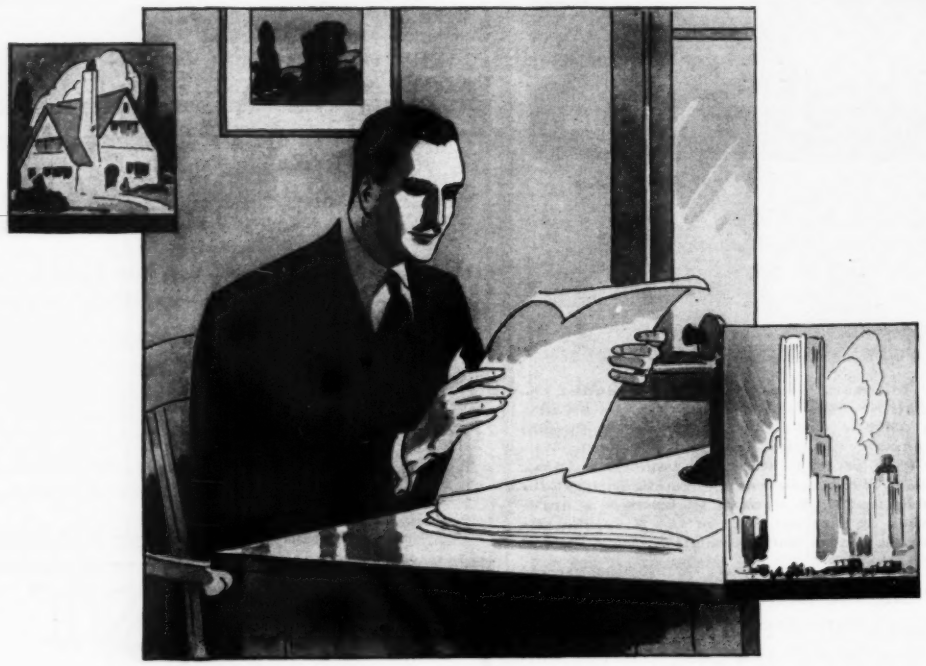

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In fact when you specify "Etna" in your contract, it amounts to a guarantee that you are getting the very highest grade of welded steel pipe that modern machinery and modern methods can produce—a pipe backed by a world-wide reputation for service.

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ETNA WELDED STEEL PIPE

Elder, were read, and Vice President H. E. Baumgartner presided, introducing all the prize winners for a few remarks. The kickers' handicap in the morning was won by H. E. Baumgartner, who received 4 golf balls. The second prize of 3 golf balls was won by J. Buday. S. H. Blackwood came third and received two balls, and J. C. Keene was fourth and received one ball.

In the afternoon, the first prize in class A was won by S. Miller, who had a net 71, and received a golf bag. The second prize of a golf trophy went to R. Moody, who had a net 72. The third prize of four golf balls went to J. A. LaDue, who had a net 73. H. E. Baumgartner had a net 74, and received three balls, and J. C. Keene and F. Engelberger tied for sixth place, each having a net 76. Mr. Keene received two balls and Mr. Engelberger one. In Class B, Earle Fiigon won a trophy as first prize with a net 71. William Patterson was second, with a net 74, and received a golf bag. The third, fourth, fifth, and sixth prizes were golf balls, and went to S. F. Wilson, who had a net 75, J. Rogers who had a net 78, A. Tesch who had a net 79, and E. A. Hamilton who had a net 80. There were three guest prizes, consisting of golf balls, that went to Val Werner, first, Benjamin Schwartz, second, and Joseph Pallita, third.

The next meet of the association will be held at the Canoebrook Country Club on July 25. The following are the afternoon scores:

Class B	G.	H.	N.
E. A. Hamilton	116	36	80
E. Fiigon	107	36	71
S. Wetzler (Guest)	114	28	86
R. A. Jack	146	36	110
W. E. Brownne	123	36	87
K. M. Cosgrove	117	36	81
J. H. Johnston (Guest)	107	30	77
L. D. Stratton	119	30	89
R. Y. Smith (Guest)	102	30	72
M. R. Carr (Guest)	99	20	79
S. H. Blackwood	126	36	90
B. Miller	133	36	97
J. M. Buday	131	36	95
E. Bender	119	36	83
M. E. Durkee	134	36	98
Werner (Guest)	105	36	69
Livar (Guest)	116	36	80
S. Wilson	111	36	75
A. Tesch	115	36	79
J. Byrne	122	36	86
J. Rogers	114	36	78
W. J. Patterson	104	30	74
Convery (Hon. Member)	119		
Hillock (Guest)	88		
F. Bluhm	148	36	112
H. S. Officer	137	36	101
C. B. Wynne	132	36	96
H. Berla	129	36	93
Class A			
H. B. Hedges	106	24	82
R. R. Owens	101	20	81
R. Moody	92	20	72
J. J. Pallita (Guest)	94	22	72
F. J. Engleberger	100	24	76
J. Miners	116	22	94
S. Miller	91	20	71
G. Hamill	101	20	81
F. C. Stille	91	8	83
A. Walsh	98	10	88
J. Ladue	79	6	73
E. M. Robinson	108	24	84
Fletcher (Guest)	96	16	80
B. J. Schwartz (Guest)	95	25	70
H. E. Baumgartner	98	24	74
E. Moore	108	20	88
J. C. Keene	100	24	76
W. B. Watson	101	20	81
J. E. Joyce	112	22	90

◆

Philadelphia H. & V. Association Plays Golf

Jack Young played host to the Heating & Ventilating Golf Association of Philadelphia for its June meet at the Llanerch Country Club, Llanerch, Pa., Tuesday, June 18. It was an ideal day for golf and a goodly number of members were present.

E. J. Meloney won his second leg on the H. J. Carr Trophy Cup in the morning round, in addition to winning the fourth prize of two golf balls. John S. Hemphill, Jr., won 1st prize in the morning round with a net 74. Joseph Luke won three balls with a net 75 for second prize. Messrs. Young and Eichberg won one ball each for 5th and 6th prizes, respectively. In

Only a perfect cutter can pass John's watchful eye

DOES it cut true? or doesn't it? That is the only question John asks as he tests each Genuine Barnes on pipe. If it doesn't, back it goes for further adjustment . . . . until the three wheels "track" —that is—*cut true.*

When you need a new cutter remember John and his watchful eye . . . and ask for a GENUINE BARNES.

Comes in all sizes to fit any pipe up to 12".

You'll find this red tag on every Genuine Barnes

The Barnes Tool Company, Inc.

Creators of the Genuine Three-Wheel Barnes

New Haven Conn.

the afternoon round Charles Williams, president of the organization, took 1st honors and three balls with a net 74. K. S. Jacobsen came in with 75 to win 2nd prize and three balls. B. Pennypacker and Lester Daub each received two balls for 3rd and 4th prizes, respectively. Fifth and 6th prizes and one ball each went to William Hughes and William P. Culbert.

In a short business session presided over by President Williams, the selection of a club for the July meet was left to Secretary Bolsinger, as there was some question whether proper arrangements could be made at the club originally scheduled.

Following are the day's scores:

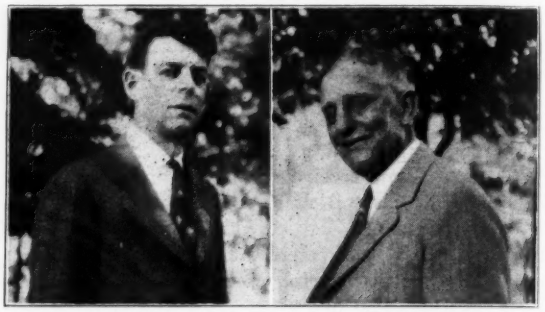
Name	G.	H.	N.	Name	G.	H.	N.
W. R. Eichberg	105	25	80	Geo. Kappel	104	24	80
K. S. Jacobsen	100	25	75	Lester R. Daub	104	25	79
E. J. Meloney	100	25	75	B. Pennypacker	102	27	75
J. S. Hemphill, Jr.	87	8	79	Geo. Kitson	108	25	83
C. Williams	84	10	74	R. C. Bolsinger	90	9	81
Wm. Hughes	99	20	79	W. G. Culbert	106	13	93
Jack Young	106	24	82	W. P. Culbert	89	10	79
J. C. Luke	No Card			W. C. Miller	122	35	87
W. G. Roeblen	105	17	88	P. Barkelew	Guest		
Lee Nusbaum	97	15	82	J. Tuckett	Guest		
Geo. Barr	109	25	84	Ed. Welsh	Guest		
R. E. Cressy	89	..	..	Wm. Johnson	Guest		
R. E. Jones	123	22	101	Thos. C. Fleming	137	35	102

◆

M. T. G. Association Holds June Meet

The June meet of the Michigan Trade Golf Association was held on Wednesday, June 19, at the Indianwood Golf and Country Club, Lake Orion, Mich., which is known as being one of the finest golf courses in the country. Through the efforts of J. B. Stewart, secretary, arrangements were made for play at the above club with Hugh T. Millar, architect of Detroit, as host.

Porter West, of the C. F. Church Mfg. Co., won a jacket as first low net prize, coming in with a 65. E. J. Anderson, of Sloan Valve Co., won a zipper golf bag for second low net with a 70. H. A. Swartz, of U. S. Radiator Corp., was close behind Mr. Anderson with a low net of 71 and won a golf bag for third prize. S. Franklin, of Speakman Co., received a rain coat for fourth place with a low net of 73.



Mr. Willison of Galloup Pipe & Supply Co., Battle Creek; R. Backens, Barnes Mfg. Co., Mansfield, Ohio. Photos taken at the Battle Creek golf meet of the Michigan and Western Trade Golf Associations

In the kickers handicap S. Franklin won first prize with a 78, C. M. McSorley second with 79, M. H. Prince third with 84, and Dennie Berry fourth with 77.

The following new members were admitted at the

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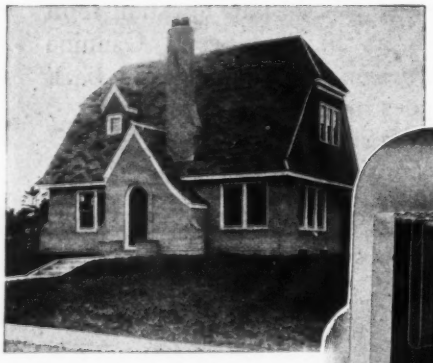

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"During this severe winter my oil bills for seventeen weeks (17) up to February 15th, have amounted to just $4.76 per week."

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The Johnston Oil-Burner Boiler gives all the care-free features of automatic heat at practically the cost of coal. It is proving its efficiency on every installation. It is helping dealers sell more oil burners.

JOHNSTON BROTHERS, Inc., Ferrysburg, Michigan

business session: William J. Hampton, Detroit City Gas Co., Detroit; Edwin M. Sterner of Flint; Charles A. Darwin, manager of Flint branch, Murray W. Sales & Co.; George H. Pipper, Miller Plumbing & Heating Co., Detroit; Chester S. Bigelow, sales manager, Capitol Brass Corp., Detroit; C. D. Allen of Park & McKay; Thomas Brown, B. F. Reynolds & Co.; George Larkin, Kimball-Eisenberg Co.; A. J. German of Detroit.

After dinner, President Bassler opened the meeting. Announcement was made that the next meet will be held at Island Country Club, Gross Isle, on July 25th.

Following were the scores:

	G.	H.	N.
J. H. Renz	115	40	75
M. D. Bowes	134	50	84
H. J. Eitel	124	32	92
B. J. Doyle	144	32	112
J. W. Bassett	104	14	90
J. P. Bassler	111	28	83
H. M. Armstrong	109	20	89
E. P. Wetey	102	20	82
H. J. Taylor	89	12	77
I. P. Young	92	15	77
M. H. Prince	119	26	93
G. W. Franzheim	103	28	75
C. McSorley	112	22	90
C. Soderberg	93	9	84
E. L. Kline	99	20	79
R. L. Deppman	119	32	87
Porter West	85	20	65
W. G. Boales	135	32	103
H. A. Swartz	83	12	71
R. K. Milward	100	24	76
D. M. Kenney	119	32	87
D. Reed	125	30	95
C. W. Gudnau	115	32	83
J. B. Stewart	118	28	90
J. F. Getty	116	32	84
D. W. Berry	117	40	77
C. Morse	95	19	76
R. W. Tempest	103	18	85
Thomas Brown	84	15	69
T. L. Jackson	118	43	75
Lewis B. Scott	115	40	75
Fred Barton	117	30	87
E. C. Donahue	104	16	88
E. J. Anderson	82	12	70
E. B. Bitzer	114	32	82
G. Pipper	100	35	65
Wm. J. Hajek	96	19	77
S. L. Franklin	93	20	73
E. J. Parrock	No Card		
J. A. Hughes	No Card		
C. D. Allen (guest)	115		
C. Darwin (guest)	88		
T. Hughes (guest)	95		
Edward Sterner (guest)	111		
Seymour Wright (guest)	103		
M. B. Shea (guest)	96		
Dr. Kahn (guest)	108		
C. Bigelow (guest)	110		
H. T. Millar (guest)	84		
Andy Galloup (guest)	100		
A. P. Johnson (guest)	103		

C. T. G. Has Large Meeting

The Youghiogheny Country club, located in the mountains outside of McKeesport, Pa., overlooking the Youghiogheny river, was the scene of the June meet of the Central Trades Golf Association on Friday, June 21.

There was a splendid turnout and a great many of the members arrived in time to play nine holes before lunch. Dazzy Vance, the handicapper, arranged the foursomes, pairing two low handicap men with two high handicap men, wherever possible. This seemed to work out very well and the players enjoyed a wonderful day of golf. The course was in excellent shape and while it was hot in the city, there was considerable breeze at the club.

One of the new members, W. Woodroof, won the iron cup.—The scores were as follows:

	G.	H.	N.
Snelsire	87	12	75
Vance	76	3	73
Kirkpatrick	79	10	69
Downe	93	16	77
Gauerman	99	25	74
McKissock	92	25	67
Tener	Picked Up		
Ottke	85	6	79
Simpson	100	25	75
Fenner	118	35	83
Hornbrook	98	25	73
Stitt	111	35	76
Wettstein	109	35	74
Kenney	102	25	77
Zeigler	102	25	77
Kinnard	116	35	81
Kahley	112	35	77
Buttlar	116	35	81
Stickrath	127	35	92
Gormley	117	35	82
DeWalt	114	35	79
Foran	110	35	75
C. Woodroof	109	35	74
W. Woodroof	118	35	83
Blackmore	90	12	78
Puffinburg (guest)	108		
Malone (guest)	100		
Gehr (guest)	127		
Kunde	100	35	65
Elter	107	35	72

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Complete With Niedecken Shower

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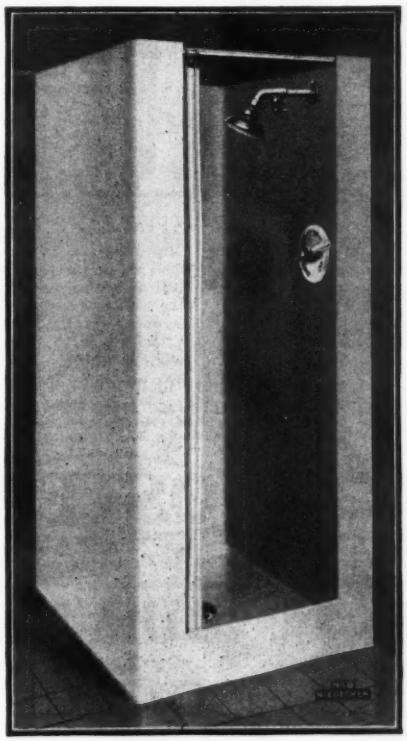

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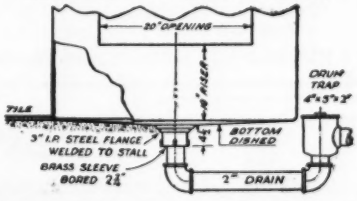

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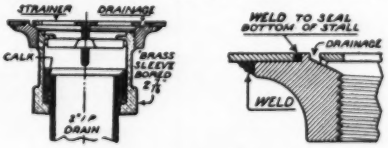

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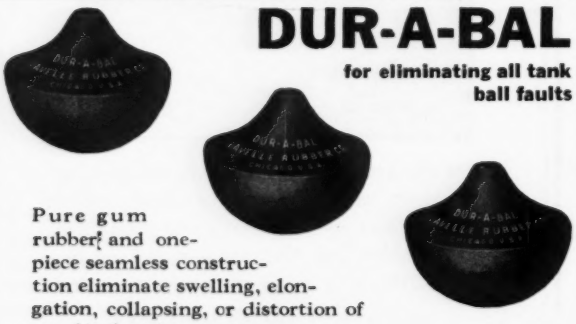

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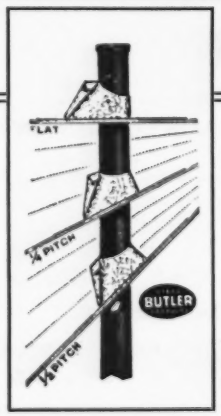

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Minneapolis : Minnesota

E. T. G. A. Plays at Westchester Hills

The Eastern Trade Golf Association recently held its June meet at Westchester Hills Country Club, with Jock Barnum and William Staples as hosts. While it was an extremely hot day, everyone enjoyed it immensely, and eighty-four were in attendance.

Leo M. O'Neil won the play-off for the Heatherton Trophy, which remains permanently in his possession. President Law and Thomas Dougherty, chairman of the tournament committee, awarded the prizes as follows: best ball foursome, class A, Ray Bookhout and Arthur R. Glore, who had a net 64, and H. D. Jackes and R. W. Pryor won in Class B, with a net 65. All of the above four were awarded a dozen golf balls given by the association.

In the afternoon medal play, C. D. Waters was first in Class A with a net 70, and selected a zipper bag, given by the association. H. N. Booth was second, with a net 72, and selected a leather golf bag given by the association. W. H. Staples and F. P. Anderson tied for third prize with a net 73, but instead of matching, Mr. Anderson voluntarily accepted fourth prize, in view of the fact that Mr. Staples was one of the hosts for the day. Mr. Staples selected a traveling set given by R. E. Peck of the General Electric Co., and Mr. Anderson selected a cigar humidor given by Harry J. Stokes of T. P. McLoughlin, Inc. O. E. Goldschmidt was fifth with a net 74, and selected an ice tub and tongs, given by the association.

In Class B, J. R. Murphy won first prize with a net 66, and selected a clock given by Evins F. Glore of Evins F. Glore & Son, Inc. J. M. Scanlan won second prize with a net 68, and selected a combined cocktail shaker and trophy cup. Thomas Yockel was third with a net 70, and selected a thermos bottle given by the association. Henry W. Reis was fourth with a net 74, and selected an umbrella given by the association. John Ney was fifth with a net 74, and selected a cigarette humidor given by the association.

The following are the scores for the day:

AFTERNOON ROUND

Class A	G.	H.	N.
O. E. Goldschmidt	90	16	74
W. H. Staples	85	12	73
D. A. McKay	86	5	81
D. H. Roney	96	14	82
H. T. Richardson	99	14	85
H. N. Booth	88	16	72
H. J. Reeves	83	4	79
E. F. Keating	78	—	78
A. Dovel	112	12	100
R. E. Peck	105	17	88
L. M. O'Neil	96	12	84
J. B. Garfield	82	—	82
C. D. Waters	88	18	70
R. G. Bookhout	106	18	88
J. Kjerner	82	4	78
A. F. Hinrichsen	96	15	81
J. B. Maloney	85	4	81
F. A. Murray	96	8	88
M. G. Hook	100	13	87
E. H. Page	96	7	89
Geo. Scott	94	16	78
A. Engle	94	17	77
S. C. Carrier	82	—	82
J. K. Law	95	6	89
W. L. Fleisher	108	18	90
W. J. Osborn	91	12	79
Keplinger	85	8	77
F. P. Anderson	73	—	73
D. S. Cruikshank	88	14	74

Class B	G.	H.	N.
E. G. Williams	110	20	90
W. B. Philipbar	135	36	99
E. W. Case	130	36	94
E. H. Ruppert	131	36	95
J. R. Murphy	102	36	66
E. Doolittle	98	22	76
J. Barnum	103	28	75
John Ney	110	36	74
W. A. Owens	103	22	81
J. G. Lawler	122	36	86
T. M. Kellogg	98	19	79
J. M. Scanlan	104	36	68
H. W. Reis	97	23	74
A. R. Glore	100	19	81
B. Bacon	120	24	96
H. Bartlett	116	30	86
T. J. Yockel	106	36	70
S. H. Sweeney	99	24	75
W. H. Carrier	101	20	81
C. Z. Smith (G.)	113	36	77
H. H. Putnam (G.)	93	—	—
M. A. Cordner	112	24	88
C. Kiewitz	115	30	85
G. E. Olsen	106	20	86
T. Dougherty	109	25	84
H. D. Jackes	103	26	77
R. W. Pryor	106	22	84
W. A. Davis	96	19	77
W. H. Murphy	100	19	81

Closed Doors Are Opened To You By

Burnham Boilers

Jacketed In Color

It's all the difference between begging for a hearing, and being invited in.

And you have the matchless Burnham fuel thrift, with heat contentment up your sleeve, to clinch the impression made by its swanky jacket of Venetian red and contrasting black.

Give It The Once Over

Here's your old friend, the Burnham Water Tube Type, dressed in a jacket of enduring steel, lined with four ply, air cell asbestos. What more could you ask? Give it the once over yourself, and see what we say is so.

Burnham Boiler Corporation

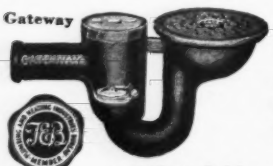
IRVINGTON, N. Y.

Representatives in all Principal Cities of the United States and Canada

50,000 of our Backwater Trap Floor Drains now in use

Signet

Gateway



There is *a good profit for you* installing these drains in homes where Backwater *gives* trouble.

Ask Your Jobber or Write Us Direct

CRAMPTON-FARLEY BRASS CO.
Kansas City, Mo.

DRAIN PIPE CLEANER

DESOLVO is an economical cleaner because it does not have to be used in great quantities in order to accomplish the work. It cleans quickly and safely and will not harden in the pipes.

THE CHAMBERLAIN CO. :: Pittsburgh, Pa.

From Your Jobber

BULLARD Roof Flashings

There are no seams, no raw edges or bolts. These points, usually the first where rust gathers, have been eliminated and, in their place, is a solid flashing so constructed that water cannot lodge upon it anywhere.

THE BULLARD SPECIALTY CO.
Tiffin - - Ohio

NIBCO Compression Fittings

For Copper Tube Plumbing

Sectional view of Nibco Coupling

The use of Copper Service Tube for all kinds of plumbing has been made possible by Nibco Compression Fittings which eliminate the necessity of cutting threads or making wiped joints. Copper Tube piping is rust-proof, non-corrosive and LESS EXPENSIVE than either brass or lead.

Write for further information about this new and better method of plumbing Today. Ask for Bulletin A-167 and mention the name of your jobber.

NORTHERN INDIANA BRASS CO.
Elkhart, Indiana

Convention Dates

September 3, 4, 5 and 6, 1929.—A. S. S. E.—The twenty-fourth annual convention of the American Society of Sanitary Engineering, to be held in Detroit, Mich., with headquarters at the Fort Wayne Hotel.

September 21, 1929.—UTAH—The semi-annual convention of the Utah State Association of Sanitary and Heating Engineers, to be held at Salt Lake City.

March 10, 11 and 12, 1930.—INDIANA—The thirty-fourth annual convention of the Indiana Society of Sanitary Engineers, to be held at Fort Wayne.

May 5 and 6, 1930.—FLORIDA—The ninth annual convention of the Florida State Association of Master Plumbers and Heating Dealers, Inc., to be held at Bradenton.

COMING TRADE EVENTS

July 27, 1929.—The Cottage Plumbers' Association and the Associated Plumbing and Heating Dealers will hold their annual outing at Spanaway.

July 29, 1929.—The Bay Counties Conference, to be held in San Francisco, Calif., at Master Plumbers' Hall.

July 30, 1929.—The annual outing of the plumbing and heating supply trades of Buffalo, N. Y., to be held at Edgewater Grand Island, the steamer leaving foot of Amherst street at 9:45 a. m.

July 31, 1929.—The Haverhill, Mass., Master Plumbers' Association annual outing, to be held at Ferncroft Inn, Middleton, Mass.

July 31, 1929.—The Haverhill, Mass., Master Plumbers' Association of Camden, N. J., to be held at a place to be announced.

August 1, 1929.—Annual Milwaukee, Wis., Master Plumbers' Association outing, to be held at H. J. Hasslinger's Resort on Moose Lake.

August 3, 1929.—The annual outing of the Mansfield Master Plumbers' Association, to be held at Sugar Grove Lake, six miles West of Galion, Ohio.

August 7, 1929.—The annual outing of the Fairfield County Master Plumbers Association, to be held at Dorlon's Point, Norwalk, Conn.

August 8, 1929.—Master Plumbers' Association of New Bedford and Vicinity, Mass., annual outing to be held at Whitfield's Pavilion, Fort Phoenix.

August 10, 1929.—Bergen County, N. J., Master Plumbers' Steam and Sheet Metal Workers' Association outing, to be held at Wherman's Park, Ridgefield Park, N. J.

August 14, 1929.—The annual inter-association golf meet between the Western and Michigan Trade Golf Associations,

Top picture: Harry G. Morrow, sales manager of Central Tube Co., Pittsburgh; Herman J. Kleinman, secretary and treasurer of golf association. Bottom picture: John Bitzer, Jr., Thomas Maddock's Sons Co., Trenton; R. F. Kleinman, Philadelphia; Russell D. Knight of Russell D. Knight Co., Philadelphia. Photos taken at the recent meet of the Delaware Valley Trade Golf Association

to be held at the Battle Creek Country Club, Battle Creek, Mich.

August 17, 1929.—The annual outing of the Utah State Association of Sanitary and Heating Engineers, to be held at Lagoon.

August 17, 1929.—The annual outing of the Brooklyn, N. Y., Plumbing Supply Credit Association, to be held at Narragansett Inn, Merrick Road, Lindenhurst, L. I.

August 20, 1929.—The annual outing of the Master Plumbers' Association of the City of Passaic, N. J., to be held at Blasberg's Farm, Hawthorne, N. J.

August 20, 1929.—The August meet of the Eastern Trade Golf Association, to be held at the Leewood Golf Club, Crestwood, N. Y.

August 21, 1929.—The August meet of the Metropolitan Trade Golf Association, to be held at the Upper Montclair Country Club, Montclair, N. J.

August 24, 1929.—The annual outing of the North Hudson Master Plumbers' Association, to be held at Maywood Grove, Fairview, N. J.

August 24, 1929.—The annual outing of the Plumbing and Heating Supply Association of Long Island, to be held at Narragansett Inn, Merrick Road, Lindenhurst, L. I.

August 25, 1929.—Denver, Colo., Master Plumbers' Association and the Colorado Society of Sanitary and Heating Engineers' outing, to be held at Roxwood Park, Boulder, Colo.

August 29, 1929.—The annual outing of the Westchester County Master Plumbers and Steamfitters Association, to be held at Colonial Inn, City Island, N. Y.

September 7, 1929.—The annual outing of the Master Plumbers' Association of Jersey City, N. J., to be held at Blasberg's Farm, Hawthorne, N. J.

September 13, 1929.—The September meet of the Western Trade Golf Association, to be held at the Glen Oak Country Club.

September 17, 1929.—The September meet of the Metropolitan Trade Golf Association, to be held at the Pelham Country Club, Pelham Manor, N. Y.

September 18, 1929.—The September meet of the Heating and Ventilating Golf Association of Philadelphia, to be held at the St. David's Country Club, Wayne, Pa.

September 24, 1929.—The September meet of the Eastern Trade Golf Association, to be held at the Fox Hills Golf Club, Stapleton, S. I., N. Y.

October 4, 1929.—The last meet of the year of the Western Trade Golf Association, to be held at the Calumet Country Club.

October 7, 1929.—The first Fall dinner and dance of the Portland, Me., Master Plumbers' Association, to be held in that city.

October 16, 1929.—The October meet of the Heating and Ventilating Golf Association of Philadelphia, to be held at the Cedarbrook Country Club.

October 17, 1929.—The October meet of the Metropolitan Trade Golf Association, to be held at the Westchester-Biltmore Country Club, Rye, N. Y.

November 20, 1929.—The November meet of the Heating and Ventilating Golf Association of Philadelphia, to be held at the Green Valley Country Club.

January 27, 28, 29, 30 and 31, 1930.—The International Heating and Ventilating Exposition, to be held at the Commercial Museum, Philadelphia, Pa.

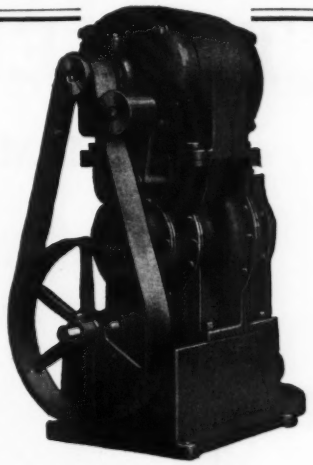
◆

Installs Modern Equipment in Executive Mansion

Whoever follows Governor Walter J. Kohler, president of the Kohler Co., as resident of the governor's mansion in Madison, Wis., will enjoy the conveniences of new and modern plumbing equipment. Governor Kohler, at his own expense, has rehabilitated the plumbing in the old historic residence on Lake Mendota.

The governor added two new bathrooms, and in addition, a new kitchen sink, with double drainboard and garbage and utensil containers has now been placed in the kitchen.

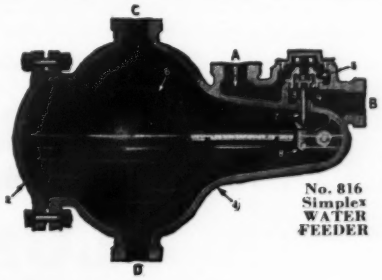
ALAMO DORWARD



Ask your jobber to show you an Alamo Dorward Rotary Power Head. Watch it in operation and *try to hear it!* Its wonderfully quiet working indicates the care in design and workmanship it has had.

ALAMO ENGINE CO.
Hillsdale Michigan

"McALEAR"



INSURE AMPLE WATER SUPPLY IN BOILERS AT ALL TIMES

No single type of Water Feeder will meet all operating conditions—hence there is a

McALEAR SIMPLEX WATER FEEDER
—AND A—
McALEAR DUPLEX WATER FEEDER

Let us tell you where both will function best.

McAlear Water Feeders have a frictionless, fool-proof valve which won't lag or stick. No other Water Feeder has this feature.

For Oil Burner Jobs use McAlear Combination Water Feeders and Low Water Cut-out Switch.

Ask for latest prices and descriptive matter today.

THE McALEAR MFG. CO.
1901-7 South Western Avenue CHICAGO, ILLINOIS
Offices in Principal Cities.

THE ELKS' TEMPLE

MEMPHIS, TENNESSEE

Architect

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FLUSH VALVES
Used Throughout

Write for full details to

PLUMBING DIVISION

Watrous Flush Valves—Duojet Closets—Self-Closing Basin Cocks—Combination Lavatory Fixtures—Pop-Up Wastes—Liquid Soap Fixtures, etc.

Sold by leading plumbing jobbers throughout the United States

THE IMPERIAL BRASS MANUFACTURING COMPANY

1231 West Harrison Street **CHICAGO**

BRANCH SALES OFFICES IN ALL PRINCIPAL CITIES

THE TRADE

NEWS FOR PLUMBING AND HEATING CONTRACTORS

Decide to Hold Convention in New York

The New York Master plumbers' state executive board meeting in Buffalo, the week of the national convention, reached the decision to hold the state convention at New York in 1930. This action was in acceptance of the invitation which came from Matthew J. Kennedy, president of the Greater New York Association. No further announcement of proposed arrangements was made.

◆

Richmond, Va., Retailers and Wholesalers Promote Co-operation

At a meeting of a committee of the Master Plumbers and Heating Association, of Richmond, Va., held jointly with the manufacturers and wholesalers of plumbing and heating supplies, July 12, at Rueger's Hotel, that city, a step was taken which will result in a furtherance of co-operation between the various branches of the industries. It was decided to bring into being what will be called an Inter-Industry Relations Committee, composed of five representatives of the Wholesalers and five members of the Master Plumbers and Heating Association of Richmond. This committee will promote the betterment of conditions in the industries. Being purely a trade relations body, this committee will have no authority except to make suggestions to be taken back to the respective associations or organizations for approval or rejection. There was a total attendance of twenty-two wholesalers, manufacturers and association members.

Wisconsin Plumbing Inspectors Announce Convention Date

Plans are being completed for the ninth annual convention of the Wisconsin Society of Plumbing Inspectors, which will take place at La Crosse, Wisconsin, August 15 and 16. Frank R. King of the state board of health, Madison, will be the principal speaker at the meeting. He will address the delegates on the subject of the state plumbing law and code. Other speakers at the meeting will include John Langdon, Mayor of La Crosse, who will give the address of welcome, and A. G. Jamesson, La Crosse, president of the state society, who will respond. A general business session with open forum discussions of problems relating to the trade is planned.

◆

Address Massachusetts Plumbing Commission

The newly created Massachusetts State Plumbing Commission met recently at the state house, Boston, Mass., and held an all-day session. Dr. George H. Bigelow, state health commissioner, and chairman of the plumbing commission, presided at the meeting, which was attended by 50 people.

Henry F. Miller of the state board of examiners in plumbing, and Francis H. Thompson of Haverhill, a journeyman plumber, presented various views of current plumbing laws and their enforcement.

Robert A. LaCentra, president of the Boston Master

Well Arranged Showroom in Meriden, Conn.

P. H. McLaughlin of 250 West Main street, Meriden, Conn., is winning new customers and renewing the interest of his old ones through the means of this exceedingly well-arranged showroom, so planned as to invite inspection, and yet so simply and commodiously fitted up with some of the latest patterns of bathroom and kitchen equipment, that each particular item is afforded independent space.

Plumbers Association, urged uniform plumbing laws throughout the state, while William E. Moore, a member of the State Association of Journeymen Plumbers, declared present plumbing laws were all right, but that the health of citizens in some cities and towns of the state was being endangered because officials were lax in enforcing regulations.

Other speakers were Thomas M. Wilson of the New England Association of Plumbing Inspectors; A. E. Roberts, Boston, and David A. Heffernan, of Milton, Mass. Dr. George H. Bigelow announced all matters would be taken under advisement.

◆

Southern California Master Plumbers Meet in San Diego

The July meeting of the Federation of Merchant Plumbers' Associations of Southern California was held at the Athletic Club, San Diego, Cal., on the evening of July 13, 1929. Considering the distance that many of the plumbers had to go to attend the meeting the attendance was very satisfactory, 164 men and women being present.

The San Diego Merchant Plumbers' Association were hosts for the occasion and presented a good program, both for the business meeting and for the entertainment features. The women were entertained by the San Diego Ladies' Auxiliary at cards following the banquet, and after the business session of the Federation all joined in an evening of dancing.

The speakers of the evening were Don Kenyon, of the California Holding Corporation, who spoke on the "Authorized Dealership" idea as introduced at Detroit; and Manager McCollom, of the Central Credit Association of San Diego, who spoke on the lien law.

An invitation was received and accepted from the Crane Co. as a result of which that concern will serve as hosts at a barbecue to be arranged for the August meeting. The September meeting will be held at Alhambra, Cal.

◆

Wisconsin Defeats Plumbing Code Amendment

Bill 279-A, which was before the Wisconsin Legislature and which was designed to amend the present plumbing law in the state so that it would bring all cities having both water-works and sewerage under the licensing law, has met with defeat in the assembly. The present licensing law extends only to cities having a population of 3,000 or over.

Although the amendment to the present state plumbing law did not contemplate any restrictions upon the home owner, it is reported that its defeat was due to the circulation of a false rumor, alleging that the amendment prohibited the farmer from running any pipe from his pump to a watering tank for his live stock.

◆

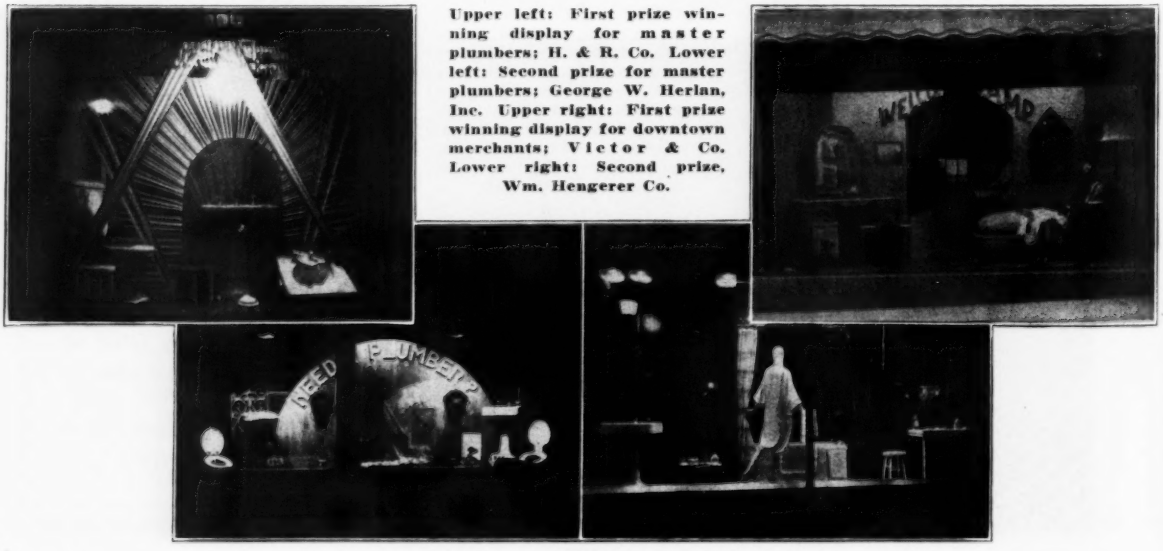
Atlanta, Ga., Plumbers and Salesmen are Guests of Chamber

Members of the Atlanta, Ga., Chapter No. 15 of the National Association of Plumbing and Heating Salesmen and members of the local organization of the Plumbing and Heating Industries Bureau, W. Reid Pucket, secretary, were guests of the Atlanta Builders' Exchange at a fish fry, Saturday afternoon, July 13.

Buffalo's Sanitation Week is Success

MASTER plumbers of Buffalo, N. Y., received a great deal of praise during the forty-seventh annual convention of the National Association of Master Plumbers, held in that city last month, for the interest they had obtained from other merchants and the daily press in Buffalo. Through the cooperation of the department of health and the mayor of the city, the week of the convention was designated as "Sanitation Week," and the newspapers gave the idea a great deal of space.

Another important plan for attracting the eyes of Buffalo citizens toward the convention, the exposi-



Upper left: First prize winning display for master plumbers; H. & R. Co. Lower left: Second prize for master plumbers; George W. Herlan, Inc. Upper right: First prize winning display for downtown merchants; Victor & Co. Lower right: Second prize, Wm. Hengerer Co.

tion, and the plumbing industry, was the window display contest conducted by the Buffalo association. Fred Fleishauer, secretary of that organization, was in charge of the window display contest, which was divided into two sections, one for members of the association, and one for downtown merchants. Fifty-eight windows were decorated especially for the occasion, thirty-eight being those of plumbing contractors, and twenty were downtown merchants. Cash prizes were awarded to the winners in the two classes, and photographs of the first two prize winners in each class are published herewith.

The H. & R. Co., 543 Sycamore street, won first prize for plumbing contractors, with one of their battery of five complete windows. Second prize in this class went to the George W. Herlan Co., 128 Northampton street. These two photographs are reproduced herewith. The following master plumbers received honorable mention for their displays: E. C. Ruchte, 2328 Main street; Elmwood Hardware and Plumbing Co., 511 Elmwood avenue; George H. Drake, Inc., 218 Lexington avenue; William C. Maunz, Inc., 1397 Jefferson avenue; and C. J. Rasp, 1801 Genessee street.

Among the downtown merchants, Victor & Co., furniture dealers, won first prize, and second prize was won by Wm. Hengerer & Co., a department store. These windows are also reproduced herewith. Honorable mention for displays of downtown merchants was given the following: Kleinhans Co., clothiers; William H. Bartlett Co., department store; and E. W. Edwards & Son, department store. One interesting window, displayed by a jeweler, contained a complete set of gold bathroom trimmings, ordered especially for the home of Douglas Fairbanks in Hollywood.

The judges who awarded the prizes for the window displays were: C. W. Wanger, president of the Woodward-Wanger Co., Philadelphia; A. M. Maddock, president of Thomas Maddock's Sons Co., Trenton, N. J.; Russell G. Creviston, general manager of the Plumbing and Heating Industries Bureau; and C. B. Nash, advertising manager of the Standard Sanitary Mfg. Co., Pittsburgh, Pa.

◆

Many Associations Plan Outings

The annual outing of the Master Plumbers' Association of Haverhill, Mass., will be held at Ferncroft Inn, Middleton, Mass., Wednesday, July 31, commencing at 10:00 A. M. The outing committee is composed of William G. N. Tyrie, C. M. Neily, and J. J. Minahan.

The Westchester Co., N. Y., Master Plumbers and Steamfitters Association plan to hold their annual outing at Colonial Inn, City Island, N. Y., Thursday, August 29, 1929. A. H. Karl is chairman of the committee and with him are associated Ralph Guion, Freddy Walsh, John Quatroni, Arthur Fuchs, and E. J. Sheppard.

The Master Plumbers' Association of Camden, N. J., will hold its annual outing, Wednesday, July 31, at a place to be announced.

The Brooklyn, N. Y., Plumbing Supply Association

Originators, designers and sole manufacturers of

1897 DEHNSANIGARD THE QUALITY GOODS 1929

There is nothing unusual about the success that the Dehn Automatic Water Softener has enjoyed—it is only a natural result of careful study of the water softening and purifying problem and of making a water softening device that would do its job well.

That device is the Dehn Automatic Water Softener. If you are not acquainted with it, ask your jobber or write us direct for details.

COMPOUND INJECTOR & SPECIALTY COMPANY
419-421 D. North Laramie Avenue, Chicago, Illinois

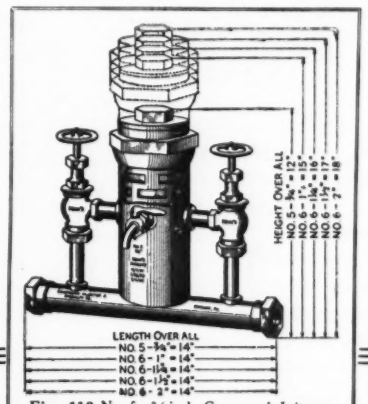


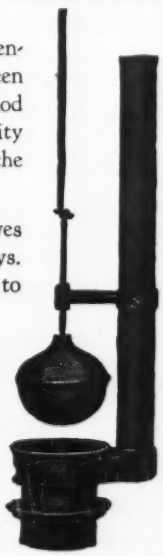
Fig. 118 No. 5—¾-inch Compound Injector. Patented in U. S., Canada and Foreign Countries.

TRENTON BRASS PRODUCTS

TANK VALVES

Complete confidence in Trenton Brass Products has been maintained over a long period of years only because quality has never once varied from the Trenton high standard.

Trenton Brass Tank Valves used once will be used always. It does not take them long to prove their worth.



The Trenton Brass & Machine Co.
TRENTON NEW JERSEY

Represented by
ROLLIN C. WILSON

7 E. 42nd St., New York, N. Y.
261 Franklin St., Boston, Mass.
13 North Ave., East, Cranford, N. J.

will hold its annual outing at Narragansett Inn, Merrick Road, Lindenhurst, Long Island, Saturday, August 17.

On Saturday, August 24, the Plumbing and Heating Supply Association of Long Island, N. Y., will hold its annual outing at Narragansett Inn., Merrick Road, Lindenhurst, L. I.

The Master Plumbers' Association of Jersey City, N. J., will hold its annual outing at Blasberg's Farm, Hawthorne, N. J., on Saturday, September 7.

The Passaic, N. J., Master Plumbers' Association are planning to hold their annual outing at Passaic, Thursday, August 22. The committee of arrangements consists of Roy Schleich, I. Choler, S. J. Dinnino, I. Taylor, F. H. Richardson, Joseph Baker, John Shedlock, Harry Vogel, Abe Levenson, Mr. Blair (Blair-O'Connor), and B. Steinberg.

The annual outing of the Denver, Colo., Master Plumbers' Association and the Colorado Society of Sanitary and Heating Engineers will be held at Roxwood Park, Boulder, Colo., August 25. G. A. Stocking is chairman of the committee of arrangements.

The Master Plumbers Steam and Sheet Metal Workers Association of Bergen County, N. J., including those of Hackensack and vicinity, will hold their annual outing at Wherman's Park, Ridgefield Park, N. J., Saturday, August 10. Harry Heckel, 162 Main street, Little Ferry, N. J., is chairman of the committee of arrangements, which, in addition, consists of H. P. Rissler, William Sorenson, W. Bott, and William Zabransky, Jr.

The Master Plumbers' Association of New Bedford, Mass., and vicinity will hold its seventh annual clambake and outing at Whitfield's Pavilion, Fort Phoenix, Thursday, August 8, from 9:00 A. M. to 9:00 P. M. Mark E. Greenleaf is chairman of the ticket committee. Sports, prizes, and dancing will feature the occasion.

The Cottage Plumbers Association and the Associated Plumbing and Heating Dealers of Tacoma, Wash., hold their annual outing at Spanaway, Saturday, July 27. The committee on arrangements is L. H. Bergh and William Buehler.

◆

Plumbing Secretaries' Association Plans Expansion

The eleventh annual meeting of the National Association of Plumbing Secretaries, held at Buffalo in connection with the National Association of Master Plumbers convention, marked the tenth anniversary of its organization by adopting plans to extend the membership of the body, which now includes forty secretaries of state and local associations.

Eleven charter members are still identified with the secretaries' association. John H. Keane, secretary of the Pittsburgh local association, who has held the office of president of the national body for five terms, declined to permit his name to be considered again, while Robert Pflug-Felder, former vice president, also refused the nomination. C. W. Wilson of Youngstown held the presidency for four terms, and H. F. Baillett of Orange, N. J. (now deceased), for one term, in addition to the incumbency of Mr. Keane.

Resolutions of sympathy were forwarded to H. W.

There's Real Money on the Roof

If you use Midland All Lead One Piece Roof Flashings, roof jobs are no longer a bother and a worry.

Instead, they're a source of real profit because the Midland's installation is easy and permanent.

Order Midlands from your jobber for better and easier roof work.

Midland Metal Mfg. Co.
Kansas City, Mo. *Newark, N. J.
*Newark plant manufactures roof flashings only.

Beware of Imitations
Insist upon the yellow label and the Midland name on every flashing you buy.

THE KAINER PRESSURE GOVERNOR
The KAINER
PRESSURE GOVERNOR
for Hot Water Heating Systems
—Reduces the cost of a hot water layout.
—Eliminates expansion tank and fittings (with its danger of freezing and overflowing).
—Simplifies installation—makes a better job.
—Saves your time and your customers' money.
—Increases your profits and builds good will.
Write us for full information
KAINER & COMPANY
CHICAGO
761-771 MATHER STREET
Manufacturers

Hammersla, secretary of the Harrisburg, Pa., local association who has been ill for some time.

The complete roster of the National Association of Plumbing Secretaries at present is as follows:

Active members:

Arnone, S. G.—612 Crescent avenue, New York, N. Y. (local).
Blake, E. J.—206 Preisler building, 133 South 11th street, St. Louis, Mo. (local).
Bracken, Joseph A.—6250 Market street, Philadelphia, Pa. (suburban).
Bohm, Edward F.—609 The Arcade, Cleveland, O. (local).
Brennen, James T.—3 Foye place, Jersey City, N. J. (local).
Bachofer, Christian—738 North 11th street, Reading, Pa. (state).
Bolton, C. A.—23 Illinois street, Chicago Heights, Ill. (state).
Etheridge, George T.—Belle Vernon, Pa. (Monongahela Valley Association).
Ebersole, Bert—1304 North Main street, Hutchinson, Kans. (local).
Farrar, R. L.—312 Chamber of Commerce building, Nashville, Tenn. (local).
Fleishauer, Fred—302 Jackson building, Buffalo, N. Y. (local).
Frankland, G. F.—1613 Metropolitan building, Toronto, Ont. (local).
Griffin, R. H.—304 Builders Exchange building, Richmond, Va. (local).
Hammersla, H. W.—Box 144, Harrisburg, Pa. (local).
Hendricksen, Ira A.—128 E. Front street, Trenton, N. J. (local).
Harkey, Thomas E.—317 Sedgwick building, Wichita, Kans. (local).
Journy, Kirk A.—304 Best building, Rock Island, Ill. (local).
Kennedy, N. J.—1222 Maccabees building, Detroit, Mich. (local).
Keane, John H.—428 Fulton building, Pittsburgh, Pa. (local).
Karbel, William F.—Intervilla P. O., Pa. (Reading, Pa., M. P. A.).
Keller, Joseph—507 2nd avenue, North, Fargo, N. D. (state).
King, Peter J.—456 Broadway, Milwaukee, Wis. (assistant secretary local).
Miller, E. L.—213 Terminal building, Rochester, N. Y. (local).
Munn, Peter—402, 111 North Dearborn street, Chicago, Ill. (local).
Meikle, W. R.—Hamiel building, Dayton, Ohio (local).
McMunn, C. A.—Clarksburg, W. Va. (state).
O'Donnell, John—706 Builders Exchange, St. Paul, Minn. (local).
Orriss, William T. J.—309 Kerrington avenue, Union City, N. J. (state).
Puckett, W. R.—402 S. E. Trust building, Atlanta, Ga. (local).
Pflug-Felder, Robert H.—788 North 26th Street, Philadelphia, Pa. (local).
Polley, W. T.—114 East Sherman street, Hutchinson, Kas. (state).
Richards, A. W.—232 7th street, Elwood City, Pa. (local).
Rhoades, James F.—509 Concord avenue, Chester, Pa. (state).
Smith, W. Brand—222 Market street, Newark, N. J. (local).
Thaler, Thomas J.—423 St. Paul street, Baltimore, Md. (state).
Trow, James H.—4 St. Peter street, Salem, Mass. (local).
Turner, Richard—27 E. Northampton street, Wilkes-Barre, Pa. (local).
Wilson, C. W.—473 Alameda avenue, Youngstown, O. (local).
Watson, G. T.—415 Castle Hall building, Indianapolis, Ind. (local).
Zuern, R. E.—Box 25, Shamokin, Pa. (local).

Honorary member:

John L. E. Firmin, 225 Tait avenue, Los Gatos, Calif.

◆

Jersey City Master Plumbers' Outing to be Held Sept. 7

The annual outing of the Master Plumbers' Association of Jersey City, N. J., is to be held at Blasberg's Farm, Hawthorne, N. J., on Saturday, September 7. The date was formerly given erroneously as September 17.

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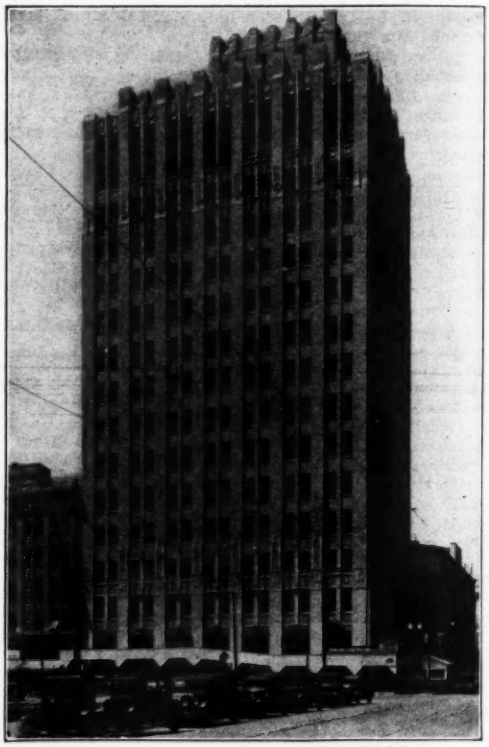

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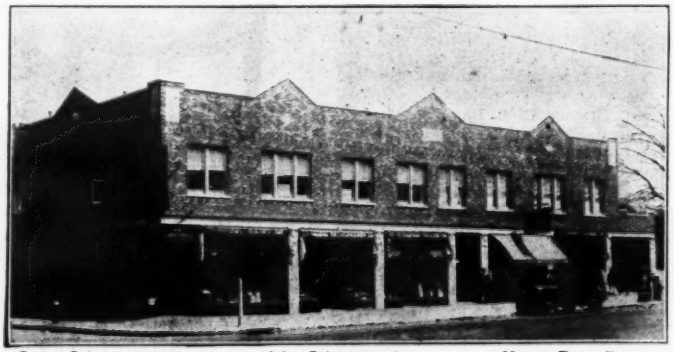

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MARKETS

BUSINESS REPORTS FROM LARGE JOBBING CENTERS

Demand Gains In Eastern Sections

THERE was somewhat of a brighter tone to reports from some of the jobbing centers as regards business for the past fortnight. In both New York and New England contractor demand for plumbing and heating materials quickened perceptibly, in the experience of most wholesalers in those districts. While business in the Central West territory varied little from the preceding two weeks, there seemed to be scattered instances of improvement that at least added something to the future outlook. The least promising of the reports came from the Middle Atlantic territory where it is said that July to date has failed to follow the pace set by June, which for many interests was one of the best months of the year in this district. On the Pacific Coast and in the Southeast demand held close to a moderate seasonal pace. The recently formed Institute of Boiler and Radiator Manufacturers, according to reports from several sections of the country, seems to have brought about an improved sentiment in trade circles with reference to these two commodities. No price changes occurred during the fortnight and makers generally are shipping promptly.

June wholesale prices of standard plumbing fixtures for a six-room house, as collected by the department of commerce from reports of twelve representative manufacturers and wholesalers, were $97.54, as compared with $98.16 in May and $100.90 in June, 1928. May shipments of enameled sanitary ware, as reported by 22 manufacturers comprising practically the entire industry, totaled 341,927 pieces, as compared with 348,385 pieces in April and 464,124 pieces in May, 1928. May shipments of vitreous china plumbing fixtures, including all vitreous chinaware which in regular practice is connected with a drainage system, as reported by 30 manufacturers, were 287,008 pieces, as compared with 282,855 pieces in April and 322,267 in May, 1928.

MIDDLE ATLANTIC

Previous Upward Pace Fails to Hold—

Reports indicate that the plumbing and heating business in the Middle Atlantic section experienced a reversal during the past fortnight to about the same level that prevailed earlier in the year. June business, in most cases, noted a stronger month in volume than any month since the first of the year; but the month of July failed to hold the same snap, and has thus far shown a falling off in the general trend of consumption.

During the two weeks previous to this report, the market in this section was on the upward swing, but the spotty tone so noticeable earlier in the year appears to have returned. Large quantity buying by jobbers is still retarded, as they are placing orders only in sufficient quantities to replenish stocks or fill the requirements of their trade. A few wholesalers give indications that business is good, but base this opinion on the fact that they are receiving orders for materials on numerous small projects. Many of the larger projects planned some months ago are still unsettled and keeping down the rate of consumption of plumbing and heating goods. Jobbers and contractors in most instances are figuring a goodly number of estimates, but difficulty is encountered in the closing of contracts. Despite the better tone in the market for the month of June and part of May, the volume of distribution for the half year mark just passed is not up to that of 1928.

During the period from July 6th to the 12th, or the 28th week, the building contracts awarded in the Middle Atlantic section jumped to $40,272,700 from $6,923,700 during the 27th week, just about doubling the largest previous figure of the 30-day period or the 25th week which had a total of $21,289,000 in contracts awarded, giving a fair indication that the demand for materials might increase appreciably.

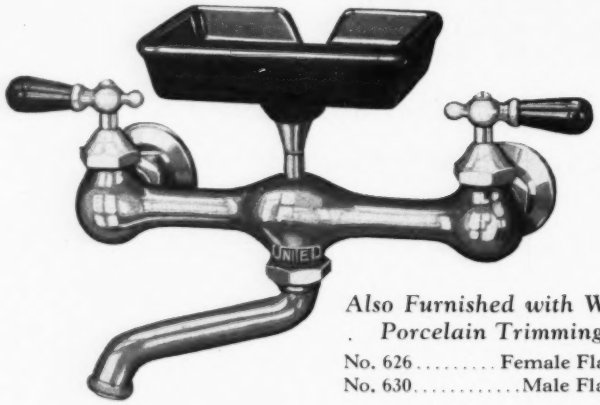
Of significance during the period were the price changes in staple pottery and boilers and radiators noted in the last report, and the new sheets issued by a number of soil pipe makers on June 10th advancing their prices to the wholesalers.

Soil Pipe

Reports from manufacturers' representatives indicate that the past two weeks did not carry a great amount of business to soil pipe producers. July thus far shows approximately as good a tonnage as June. Numerous orders were placed for future delivery at the new prices and some were given for immediate delivery. The review period shows a fairly good tonnage as a whole but fails to reach the total for the same season last year. The brighter aspect is the inclination of jobbers to place orders in greater quantities than heretofore. Most makers are delivering promptly while some, due to curtailed production, are experiencing a little difficulty.

Pipe—Brass, Steel and Wrought Iron

Although shipments of wrought iron pipe decreased in the early part of June the latter part of the month and early July noted a fairly good demand, it is reported. July was reported as giving indications of being



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No. 630 ..... Male Flanges

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No. 626 ..... Female Flanges
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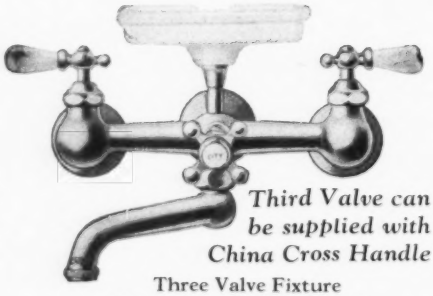

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Three Valve Fixture
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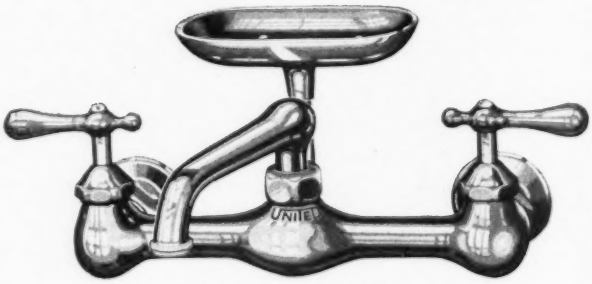
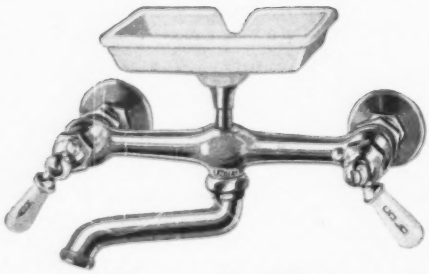
No. 630 ..... Male Flanges



No. 627 with Female Flange
No. 631 with Male Adjustable Flange



No. 1626 ..... Female Flanges
No. 1630 ..... Male Flanges

Any of above Fixtures furnished either NICKELPLATED or UN-I-CHROME FINISH, with White, Black or Colored Porcelain Trimmings.

Also supplied with METAL HANDLES and METAL SOAP DISH.

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Demand!

UNITED

TRADE MARK REG. IN U. S. PAT. OFFICE

UNITED-OBERNDORF CORP., CLEVELAND, OHIO

the largest in point of volume since the first of the year. Steel pipe continues to be required at about the same pace as the early part of the 30-day period. These conditions are due in a large measure to releases received on several large projects in the section, this being particularly true of the tonnage of wrought iron pipe consumed. The brass pipe market has undergone little, if any change, during the interval, and prices are being steadily maintained on all three commodities. Deliveries are prompt in every instance.

Fittings

Wholesalers continue to buy only such brass, malleable and cast iron fittings as are required by them to furnish master plumbers on definite orders. However, a little greater inclination on the part of the jobbers to replenish the deficiencies in their business gives a more optimistic tone to the market for these goods. Most producers reported their business as being considerably behind last year's total at this time. Prices are firm and orders filled in a reasonably short time.

Enameled Ware

Master plumbers have not demanded enameled iron fixtures in sufficient numbers to warrant shipment of any greater volume during the past fortnight than heretofore during the month of June or early July. Last year's commitments exceed by quite a margin the distribution so far in 1929, and a much larger consumption of enameled ware must take place during the next few months to offset the decline of the past months. Shipments are promptly made, and prices in this section are firm.

Pottery

The pottery market on the whole has been off throughout the past 30-day period. Of outstanding significance during the period was the price reduction on wash-down bowls and tanks, which tended to stimulate some business in these items. Jobbers, however, are still disinclined toward heavy buying, and most of the projects requiring these fixtures are of the smaller type, the larger projects not being released with any regularity. Prices since the change are being held firmly, and potters are able to deliver quite promptly.

Plumbers' Brass Goods

Business in the tubular and cast brass goods line during the past fortnight, has reverted to the tone of the earlier part of June, when activity was light in these commodities. Commitments were better during the last two weeks of June giving the month a fairly large volume, but the consumption of the period could not be called seasonably good. Wholesalers are prone to buy only to meet immediate requirements, and not to increase their inventories to any appreciable extent. Distributors' prices are unchanged, and shipments are received in good time.

Range Boilers

A few manufacturers of range boilers reported during the past 30 days that business for the period was exceeding that of last year. However, 1928 was not up to the standard of other years in the volume of boilers consumed in this territory. Manufacturers have experienced a rather steady demand for their goods during the past month or six weeks, but are not called upon to supply large orders, as the demands are comparatively small in most instances. The brighter side of the picture for the period was the steady maintenance of the current price. Range boilers are quickly available from producers.

Boilers and Radiators

July sales thus far are reported to be exceeding June by quite a margin in this section in the case of one larger manufacturer. The withdrawal of preferentials caused heating contractors and jobbers to come into the market with more intensity than has been experienced by producers in some time. The volume for the earlier part of June fell off slightly but has increased steadily up to this time, and many orders have been received for future delivery. The new sheets are being maintained and shipments are quickly made.

CENTRAL WEST

Building Operations Take Only Fair Volumes—

No developments of an outstanding nature marked business in the plumbing and heating field in this territory during the past fortnight. A few instances are found where wholesalers experienced a slightly better call from contractors for material but as a general rule demand held at about the level which marked the preceding like period. The majority of wholesalers interviewed say that their sales volumes for the first six months of the year were considerably below those for the first half of 1928 and in many instances manufacturers' totals disclose a similar falling off.

Activity in the heating field quickened during the past two weeks with the announcement around the first of the month by manufacturers of the withdrawal of their discounts and old selling arrangements. Makers booked a substantial tonnage of business at the time of the price change and they are now quite busy shipping as specifications arrive from their customers.

In the Central West, according to F. W. Dodge Corp., construction activity for June lagged slightly behind the record for the preceding month. The total for the month amounted to $187,983,100, which is 6 per cent less than the amount of construction work in May, but only 2 per cent less than the June, 1928, total. The June contract record brought the amount of new work started for the first six months of the year to $928,369,900, as compared with $1,015,784,600 for the first half of 1928, which represents a decrease of 9 per cent.

Soil Pipe

The soil pipe market is reported to be generally firm at the current base prices of manufacturers, but as yet little business has been placed by wholesalers at this level. Wholesalers' stocks are of no better than average size and, in order to keep their holdings at a safe working level, they are forwarding specifications to manufacturers against contracts entered into when prices were recently advanced about as pipe is moved into consumption. Foundries are working on a curtailed production basis but generally quick shipments are available.

Pipe—Steel and Wrought Iron

Manufacturers' representatives seem to be quite well satisfied with the tonnage of steel pipe that is moving into this district and they say that volumes show little change from one fortnight to another. Steel pipe mills are reported operating at a high scale of production and distributors for plumbing and heating needs in this territory, most of whom are maintaining only average stocks, experience no difficulty in securing pipe from mills as wanted. Wrought iron pipe mill salesmen also find demand from their distributors holding at a steady pace and mills have sufficiently large stocks to take care of jobbers' requirements quickly. Neither wrought iron nor steel pipe mills have changed their prices.

Fittings

The consumption of the various types of fittings by contractors is said to be fairly good, although most reports indicate that volumes during the first half of the year were not equal to the corresponding period of 1928. Wholesalers are maintaining average

working stocks of fittings and are re-ordering from manufacturers about as material is moved into consumption. Makers are in possession of ample stocks and wholesalers experience no difficulty in getting material as wanted. Makers have not changed their prices.

Enameled Ware

In some cases wholesalers say that there has been a slight improvement noticeable since the first of the month in calls from master plumbers for enameled ware, but it seems that in the majority of instances jobbers have experienced very little change in the volume of ware that they are moving into consumption. Stocks at wholesale sources, while not ordinarily heavy, are large enough to take care of current needs. No price changes had been announced by manufacturers at the time of going to press.

Pottery

There have been no developments of an outstanding nature in the pottery market since our last report was published. Wholesalers say that master plumbers' current requirements are only fair but that there is a good amount of figuring under way for contemplated projects. Manufacturers' representatives in this territory find new business rather light and most orders from jobbers small in size. Makers' prices have not been changed.

Plumbers' Brass Goods

Most of the brass goods salesmen interviewed during the past fortnight indicate that new business was light in the Central West territory for the period and also considerably below that for the corresponding period of 1928. The first quarter of the year, however, was very satisfactory for most producers and stocks taken in by jobbers at that time are said to be sufficient to take care of current needs in most instances. No price changes have been announced by manufacturers.

Range Boilers

Most reports gathered during the past two weeks indicate that the range boiler market moved along at a fairly smooth pace. The majority of jobbers are holding good stocks and re-ordering from factories as material is moved into consumption. The market is reported firm at the current sheets of manufacturers.

Boilers and Radiators

Most boiler and radiator manufacturers interviewed say that business is much better than it was 60 days ago. In the past fortnight quite a large number of specifications have reached makers to be applied against business entered into when prices were changed recently. Factories are said to be in a position to take care of orders without delay.

NEW YORK

Large Operations Maintain Activity—

Contractor demand has shown a perceptible increase in this territory during the past two weeks, according to a survey of representative wholesalers. The advances in the price of soil pipe and boilers which occurred some weeks ago have stimulated interest among contractors for material for work on hand and under negotiation; these changes in prices have influenced buying to a certain extent in items other than those affected. However, there is no disposition on the part of wholesalers to feel that business thus far in July is comparable with that of a year ago for the corresponding period or for the year to date. With the exception of a few lines, manufacturers reports coincide with those of wholesalers.

During the week July 6 through July 12 there was $18,851,100 worth of contracts let for new building and engineering work in the Metropolitan District of New York, according to F. W. Dodge Corporation. When compared with the records for the preceding week and the corresponding week of last year, there were decreases of 43 per cent and of 42 per cent, respectively. Last week's contract total brought the amount of new construction work started in this territory since the first of this year up to $641,647,100. This figure shows a daily average of $3,960,800, while the daily average of contracts awarded for new construction for the first seven months of 1928 amounted to $5,149,600. New contemplated projects reported during the past week in this area reached a total of $27,458,200, being about three times greater than the amount reported during the preceding week and an increase of about $6,000,000, over the amount reported during the corresponding week of a year ago.

Activity in this territory is mainly confined to furnishing materials for major operations, such as hotels, office buildings and utilities. Small residential work in the outlying districts is reported as slow, as is apartment house construction in the City of New York. Many wholesalers who are in close touch with work contemplated by builders in their territories feel that a notable back-log of new construction is merely awaiting an opportunity for financing on favorable terms.

In upper New York State business is reported by several wholesalers as being irregular in volume, credit being a restraining factor in some instances, with the decline in building operations being responsible in the main for lowered volume in comparison with that of a year ago.

The export trade is reported by some manufacturers as being equal to or better than that of last year to date; on the other hand, representative exporters of plumbing supplies state that demand is showing a decreasing trend in comparison with that of 1928. South America has shown the most sustained volume according to many reports, but in sugar raising countries there has been a marked hesitancy in making forward commitments, since the proposed increase in the American duty on sugar may affect the business in those countries adversely.

Soil Pipe

The movement of this commodity is reported by several manufacturers as being measurably better during the past fortnight, in comparison with the volume during May and June. Wholesalers' stocks are reported as being only fair, and requisitions are made on mills promptly for replacement of contractors' requirements. Owing to the lack of demand during the past few months, many plants have a reduced schedule of operations, and inventories of makers are therefore reported as being moderate. Prices of wholesalers and manufacturers are unchanged.

Pipe—Brass, Steel and Wrought Iron

The movement of wrought iron pipe continues to compare favorably with that of a year ago, according to resident managers of several manufacturers. This fact is, of course, contrary to the general trend in the supply industry and is accounted for in part by the sustained demand from industrial plants. Brass and steel pipe are likewise enjoying better demand, relatively, than for the same period a year ago. There have been no changes in prices by manufacturers, and wholesalers report that their quotations are in strict conformance with present-day costs. Stocks are normal in all stages of distribution.

Fittings

Manufacturers report demand as being steady, with a perceptibly better tone since the first of the month. Interest centers mainly in materials for industrial replacements and large

utility and office operations. There have been no changes in prices, and stocks on hand at mills and among wholesalers are described as adequate under existing conditions.

Enameled Ware

The movement of enameled ware continues below normal in this territory, according to most manufacturers and wholesalers. Stocks on hand are considered normal, and there is no delay in filling requisitions on plants.

Pottery

The effect of the price reductions reported about two weeks ago has been watched with interest by students of market conditions, who report that no marked impetus to the volume of business resulted. Wholesalers' stocks are reported as being fair, and there has been a slightly increased demand for specified items for large projects now under construction. Potteries are as a rule able to ship requirements promptly.

Plumbers' Brass Goods

The increased sale of copper for export during the past fortnight has created a more favorable sentiment in trade circles with reference to cast and tubular brass products, it is reported. The volume of business reported by representative manufacturers continues considerably below that of a year ago, however, and is also lower than for the early part of this year. Specifications by wholesalers show an increasing trend nevertheless, reflecting the exhaustion of stocks purchased earlier in the year. Factories are able to meet requirements promptly in most instances, and no changes have been reported in prices by either makers or distributors.

Range Boilers

There has been a well sustained demand among wholesalers for this commodity during the past two weeks, and the relatively large volume moving in comparison with other items is attributed by many interests as being due to replacement business. Allied lines, such as hot water storage, pneumatic and oil tanks are also showing satisfactory sales at all points of distribution. Prices are firm by manufacturers and wholesalers alike, and fairly prompt shipment of stock items can be made by factories. One manufacturer of copper range boilers withdrew prices during the current week.

Boilers and Radiators

Since the inauguration of the Institute of Boiler and Radiator Manufacturers, sentiment in trade circles seems to have improved considerably with reference to these commodities. Recent revisions in price sheets are being strictly adhered to in all channels of distribution, and there has been a marked increase in foundry shipments during the past two weeks. Dealers' stocks are reported as being somewhat below normal, but adequate, and mill inventories fair.

NEW ENGLAND

Contractors' Needs Are More Extended—

Within the past fortnight the demand for plumbing and heating materials has quickened perceptibly, according to manufacturers and wholesalers. Sales volumes have not reached the levels which were recorded for the first half of 1928 but, considering the delinquencies experienced in the foregoing months of this year, the past several weeks have shown considerable betterment. The construction program has been making forward strides in quite steady manner, to the point where contractors are now steadily engaged in roughing-in and finishing processes. A number of projects of sizeable dimensions are being turned out of architects' offices, which will have their inception in the near future, and it is reported that there are a large number of plans in the making.

There is a somewhat brighter tone to the reports received from manufacturers' representatives, for wholesalers seem more inclined to buying in larger quantities for the increased demand which they anticipate during the coming months. Estimating departments of both makers and distributors are more occupied than they have been at any time during the year and it is expected that a good majority of the quotations submitted will develop into actual orders in a short period of time. Summarily, the New England states, taken collectively, have begun to feel a reactive trend of business from the formerly quiet conditions which have prevailed during earlier months.

Both wholesalers and manufacturers are amply equipped to offer delivery service to their respective customers. Prices quoted by producers and distributors during the past several weeks reflected no departure from previously existing levels.

Soil Pipe

In some sections plumbing contractors have been starting work in such volume as to cause fairly sizeable inroads on local jobbers' stocks. Such activities are not apparent throughout this area, however, but soil pipe shipments, both from wholesalers' warehouses and from foundries have indicated that demand for this commodity has assumed normal proportions. Foundry prices continued firm throughout the past fortnight. Makers show ability to make deliveries shortly after receipt of orders.

Pipe—Brass, Steel and Wrought Iron

Better activities in the plumbing and heating field have tended to give mill salesmen a brighter outlook for the coming months. Wholesalers describe business as running along moderately well with a tendency towards increase as new operations are being incepted. Consumption of steel and brass pipe, has been of sufficiently good dimension as to cause distributors to lay in larger stocks than they have been carrying heretofore. Wrought iron mills are operating steadily and are in receipt of quite satisfactory tonnages from this area. No price changes have been announced by producers. Deliveries are prompt in all cases.

Fittings

Malleable and brass fittings are moving steadily from sources and are being turned over by wholesalers in quantities which reflect the better demand on the part of contractors. Manufacturers allow some deficiencies in their receipts for the first half of this year, but are most optimistic over the prospects which are presented. Distributors' holdings are reported to be of ample nature and their deliveries are consequently quite satisfactory to their trade. Makers, too, are producing steadily and offer prompt delivery to their customers.

Enameled Ware

Master plumbers are ordering a considerable quantity of enameled ware and this steady business, which is somewhat of an improvement over that which former months contained, has created a better buying movement on the part of jobbers. Carload and replacement orders by the latter have given manufacturers an increased percentage over the past months and wholesalers are presently trying to close a number of contracts which will considerably increase the enameled ware status of demand.

Pottery

Pottery sales during the past several weeks showed but little change over those which were experienced by jobbers and pottery salesmen in the month of June. There is some increase noted, however, in contractors' requirements, for a number of larger

operations and residential operations have been advanced to the stage where pottery installations are necessary.

Plumbers' Brass Goods

Many of the offices of manufacturers in this territory report that their receipts are more consistent as the consumption demand increases. Wholesalers agree that their dispositions of cast and tubular goods are better than they have been for some time and are consequently keeping their stocks well regulated and of larger proportions than heretofore.

Range Boilers

Consumption of range boilers continues to improve, according to wholesalers. Demand is not in excess of the level which is regularly experienced at this season of the year, in fact it is somewhat lacking as compared with the first-six-month totals of previous years. Manufacturers report that their receipts are quite satisfactory and that their plants are busily engaged.

Boilers and Radiators

This market continues to hold the strength of prices which it obtained during the early part of the month. Heating contractors are becoming more engaged as new developments are presented and distributors are consequently more concerned as to the upkeep of their holdings.

SOUTHEAST

Buying Interest Remains Moderate—

Business trends as related to the plumbing and heating field have been rather irregular in the Atlanta territory for the past fortnight. Buying is reported to be good in some commodities while in others it is light. The continued hot weather has had its effect on the heating industry and most business developed was primarily for replacement work, with little new business had. Several large construction projects are under course of erection, and will be ready for plumbing and heating installations shortly. As a rule, jobbers are maintaining stocks large enough to meet the requirements of the plumbing and heating contractors. Prices remained firm during the past fortnight with the majority of jobbers adjusting their prices to meet the changes noted in our last report as announced by pottery makers and boiler and radiator producers.

Soil Pipe

According to most wholesalers the past fortnight failed to show any great amount of new business in soil pipe. Stocks are being maintained in good assortments by sellers in the Atlanta territory and no difficulty has been reported in securing supplies promptly. No price change has occurred since our last report.

Pipe—Brass, Steel and Wrought Iron

Consumption in brass, steel and wrought iron pipe slowly continues to rise, and sellers report a fairly good volume of new business covering the past fortnight. Orders for carload lots were few but wholesalers as a rule are keeping their stocks of a sufficient size to care for the immediate requirements of contractors. Mills are making prompt shipments and no price changes have occurred since our last report.

Fittings

Plumbing and heating contractors' orders for fittings were only moderate during the past week, according to most jobbers. Consumption has changed little from the seasonal rate which has continued for the past two

The Stock Market

Range for Week Ending July 20, 1929†

Par Value	1929 High	1929 Low		*	Weekly High	Weekly Low	Weekly Close
NP	186	95⅛	Air Reduction Sales Co.	A	181¾	164¾	176⅛
NP	54½	39	American Rad. & Stand. San. Corp.	A	54½	49¾	52⅛
25	134⅝	106½	American Rolling Mills Co.	A	132⅞	128¾	130
50	140	99	Anaconda Copper Mining Co.	A	115⅞	107⅞	115⅞
NP	57	35	Bastian-Blessing Co.	C	57	52½	57
NP	120¼	82⅛	Bethlehem Steel Co., com.	A	120¼	114⅜	120
100	123	116⅝	Bethlehem Steel Co., pfd.	A	120	118½	120
NP	55¼	35⅝	Brunswick-Balke-Collender Co.	A	39½	35⅜	38¾
NP	192⅞	122¾	A. M. Byers Co., com.	A & E	143¼	138	139
100	121¼	105	A. M. Byers Co., pfd.	A & E	110¼	110¼	110¼
100	127½	118	Century Electric Co., com.	F	118	118	118
50	4¾	2	Chicago Nipple Mfg. Co., "A"	B	3	3	3
50	1½	1	Chicago Nipple Mfg. Co., "B"	B	1	1	1
25	48	44¾	Crane Co., com.	C	46¼	45	46¼
100	119	112	Crane Co., pfd.	C	115	115	115
20	21	16½	Eagle-Picher Lead Co.	H	17	16½	16¾
NP	35	14	Fairbanks Co., pfd.	A	30	19	29½
NP	51¾	40¾	Fairbanks, Morse & Co., com.	A	43¼	41⅝	42⅜
100	110⅝	106¾	Fairbanks, Morse & Co., pfd.	A	107	107	107
NP	19½	12	Greenfield Tap & Die Corp.	B	16	16	16
NP	35	24¾	Iron Fireman Mfg. Co.	C	30¾	29½	30
NP	242¾	152½	Johns-Manville Corp., com.	A	200¾	186¼	196½
100	123	119	Johns-Manville Corp., pfd.	A	120½	120	120½
100	122¾	117	Jones & Laughlin, pfd.	A & E	120¼	119	119¼
NP	96¼	55¾	Minneapolis-Honeywell Reg. Co., com.	B & C	90	90	90
100	161	142½	Minneapolis-Honeywell Reg. Co., pfd.	B & C	161	161	161
NP	74	48	Modine Mfg. Co.	B & C	70	67	70
NP	48⅜	39	Motor Wheel Corp.	A	48¼	44⅛	48⅛
NP	39	33½	F. E. Myers & Bro. Co., com.	G	36	36	36
100	105	105	F. E. Myers & Bro. Co., pfd.	G	105	105	105
100	173	132	National Lead Co., com.	A	154	152	152
100	141½	138¼	National Lead Co., pfd. "A"	A	139¼	138¼	138¼
100	122	118	National Lead Co., pfd. "B"	A	119	118	118
NP	17	6½	National Radiator Corp., com.	A	7	6½	6⅞
NP	41	14½	National Radiator Corp., pfd.	A	19	18	19
5	31	23	Herman Nelson Corp.	B	27	27	27
NP	21	18¾	Neptune Meter Co., "A"	B	18¾	18¾	18¾
NP	92	80⅛	Ohio Brass Co., "B"	B & G	83⅛	81¼	83⅛
NP	54⅞	42¾	Republic Brass Corp.	A	44⅞	44	44⅞
NP	111	93⅝	Republic Brass Corp., "A"	A	100	100	100
NP	19⅜	8	Richmond Radiator Co., com.	B	8⅜	8⅜	8⅜
NP	36½	29½	Richmond Radiator Co., pfd.	B	30	29⅛	29¼
NP	44½	41	Ruud Mfg. Co.	C	41	41	41
NP	52¼	54	Spang, Chalfant & Co., com.	A	40¾	39	40¼
100	97	89	Spang, Chalfant & Co., pfd.	A	93	93	93
NP	39½	26	Time-O-Stat Controls Co., "A"	C	30	29	30
NP	128	75¼	Union Carbide & Carbon Corp.	A	127	122¼	123⅝
20	55⅞	27	U. S. Cast Iron P. & F. Co., com.	A	32	30½	30⅝
NP	19	16⅞	U. S. Cast Iron P. & F. Co., 1st pfd.	A	17⅝	17½	17⅝
NP	20	18⅝	U. S. Cast Iron P. & F. Co., 2nd pfd.	A	19¾	19¾	19¾
NP	62¼	43	U. S. Radiator Corp., com.	B & D	53	53	53
100	100	100	U. S. Radiator Corp., pfd.	D	100	100	100
NP	65	42	U. S. Rubber Co., com.	A	52	49½	50
100	92½	73	U. S. Rubber Co., pfd.	A	78	75	75
100	209⅜	157½	U. S. Steel Corp., com.	A	209¾	198	207⅜
100	144¼	139¾	U. S. Steel Corp., pfd.	A	140¼	139¾	140
NP	22¼	10⅝	Universal Pipe & Radiator Co.	A	11⅞	11⅛	11⅞
NP	46¼	23⅛	Walworth Co.	A	46	40⅜	44⅞
NP	35	17	Wayne Co., com.	B & C	19	18	18
NP	46	35	Wayne Co., pfd.	B & C	35¼	35¼	38⅛
100	100¼	93	Wheeling Steel Corp., com.	B	100¾	97¼	100¼
100	135½	131½	Wheeling Steel Corp., pfd. "A"	B	133	133	133
NP	29¾	20	Williams Oil-O-Matic Htg. Corp.	C	23½	23	23½
NP	158¼	145	Youngstown Sheet & Tube Co.	A	156½	148	156½

*Where listed—

A—New York Stock Exchange
B—New York Curb Exchange
C—Chicago Stock Exchange
D—Detroit Stock Exchange
E—Pittsburgh Stock Exchange
F—St. Louis Stock Exchange
G—Cleveland Stock Exchange
H—Cincinnati Stock Exchange

†If there is no trading during current week, range represents last week recorded.

A Plumber Is Judged By The Septics He Installs

A cheap septic means a poor plumbing job; trouble is in store for the plumber, cost for the owner, reputation is damaged, confidence of customers is lost. A filth disease is likely to become epidemic — death may be the toll of the inferior septic.

On the other hand, consider the high quality septic — San-Equip, with its patented features of construction. The use of San-Equip on the job shows that the plumber prides himself on good work — customers will stay pleased — every aid is given sanitation. A good reputation is built.

Only San-Equip Can Use the San-Equip Features

Protected by U. S. Patent No. 1708118

Beware of Infringement—Making, selling or installing septic tanks which copy the patented features of San-Equip design, whether done by manufacturers, master plumbers or users will constitute infringement.

CHEMICAL TOILET CORPORATION

918 E. Brighton Avenue

Syracuse, N. Y.

The Metal Market

	July 23	Average June, 1929	Average April, 1929	Average 1928
PIG IRON—				
No. 2 foundry, Chicago	$20.00	$20.00	$20.00	$18.54
PLATES AND SHEETS—				
Steel boiler plates, Pittsburgh, per lb.	1.95c	1.95c	1.95c	1.87c
*Blue annealed sheets, No. 13, Pittsburgh, per lb.	2.35c	2.35c	2.15c	2.03c
Black sheets, No. 24, Pittsburgh, per lb.	2.85c	2.95c	2.90c	2.75c
TIN—				
Straits tin	45½c			
LEAD—				
Chicago	6.75			

The Old Metal Market
Dealers' Buying Prices

	Per lb.		Per lb.
Aluminum clippings	18 c	Copper, light	11½c
Block tin	41½c	Copper, uncrucibled wire	14½c
Brass, light	7½c	Faucets and valves	10 c
Brass, heavy mixed	8¾c	Lead, heavy	4½c
Brass, red	11½c	Solder Joints	8 c
Copper, crucible	13 c		

NOTE: Prices are those quoted on Tuesday of this week.
*Comparisons are with old blue annealed base, No. 10.

months. But some sellers report a favorable condition resulting from inquiries regarding future delivery orders. Manufacturers have not changed their price sheets on brass, cast iron or malleable fittings, and shipments are being made with promptness.

Enameled Ware

Shipments of enameled ware into the Atlanta territory seem to be continuing at about the same level established last month, which was considered a rather normal condition for this time of the year. While contractors have not been as busily engaged as they might have been, prospects for the near future are bright, according to many manufacturers' representatives interviewed. Makers have made no price change and shipments are made on schedule.

Pottery

While there has been no improvement of any magnitude in the pottery market in the Atlanta area for the past ten days, inquiries have developed for material for several large projects scheduled to be ready for installation work shortly. Wholesalers report sufficient stocks on hand to care for the current demands of contractors. No price changes have been announced since our last report.

Plumbers' Brass Goods

Contractor demand for plumbers' brass goods continues at a steady, moderate rate, and most wholesalers report a rather satisfactory business. Some new business developed during the fortnight but most of these orders were for fill-in purposes. No word of any price changes have been received from makers.

Range Boilers

Reports indicate that the range boiler market is firm at the current price sheets of manufacturers. No change in prices has occurred since our last report. In the majority of cases wholesalers have fairly good stocks which are of sufficient size and assortment to care for the immediate needs of their trade. Shipments are being made with promptness.

Boilers and Radiators

A moderate demand for boilers and radiators continues in the Atlanta area with some new business reported. Some new small work and repairs kept contractors fairly busy, but the hot weather has checked any large advance in new business. Jobbers have adjusted their price sheets to the changes announced in our last report. The market remains firm and supplies are being shipped on schedule.

PACIFIC COAST

Demand Holds At Even Pace—

Coast business generally appears to hold at the same level which has prevailed for the past few months. New building, while not as heavy as it was at this period last year, is of a fairly satisfactory nature. Materials of all kind are plentiful and the needs of the trade are filled without delay. Jobbers' prices to the trade are closely following replacement costs and are more firm in some sections than in others.

Soil Pipe

Soil pipe continues to move in moderate volume with most sales in small lots for immediate requirements, very little forward buying being in evidence. Jobbers are carrying substantial stocks and all the trades' needs are being filled without delay.

Pipe—Steel and Wrought Iron

Steel pipe is moving in a fairly satisfactory volume, about normal for this period of the year, although most purchasing continues to be for actual requirements. Jobbers' prices, while varying somewhat in the different jobbing centers, remain unchanged. Wrought iron pipe shows little if any change in demand and continues to move mostly in small lots for immediate requirements; and, taken as a whole, a fair amount of tonnage is being consumed at present. Distributors of this commodity are carrying sufficient stocks to take care of the present needs of the trade. Prices are unchanged.

Fittings

Cast iron screwed, drainage and malleable fittings continue to be in moderate demand, with most orders being in small lots for current needs or to sort up stocks. Distributors generally have well balanced stocks and can also secure early delivery from all manufacturing sources. Distributors' prices on these commodities vary somewhat in the different jobbing centers.

Enameled Ware

A fairly satisfactory volume of enameled ware is being consumed at present and known needs assure of this volume being maintained, it is reported. This commodity is manufactured on the coast in greater quantity than the coast itself can consume with the result that immediate delivery of the trade's needs can be made. Jobbers' prices generally remain unchanged.

Pottery

Recent price changes have stimulated the demand for this commodity to some extent. Distributors are carrying stocks sufficient to take care of all of the trade's needs without delay and coast potteries can make prompt shipment of all orders received.

Plumbers' Brass Goods

Plumbers' brass goods continues to be in good demand. Distributors generally have well balanced stocks. Distributors' prices to the trade vary in the different jobbing centers and are more firm in some than in others, according to reports.

Range Boilers

A moderate demand for range boilers continues which shows little variance from week to week. Distributors are carrying sufficient stocks to assure the trade of prompt shipment of their needs.

Alameda County Masters Re-Elect W. H. Picard

Having rounded out another year of aggressive effort, with a gratifying amount of progress to show for it, the Alameda County Merchant Plumbers Association met at its headquarters, 538 Twenty-fourth street, Oakland, Calif., July 8, and selected the following officers for the coming fiscal year: W. H. Picard, president; J. W. Durant, vice president; V. A. Edgeworth, business manager; J. B. Morse, secretary; John W. Rankin, treasurer, and William J. Mulgrew, sergeant-at-arms. Both Mr. Picard and Mr. Edgeworth are serving their fifth terms as president and business manager, respectively, while Mr. Morse is occupying the post of secretary for the seventeenth consecutive year.

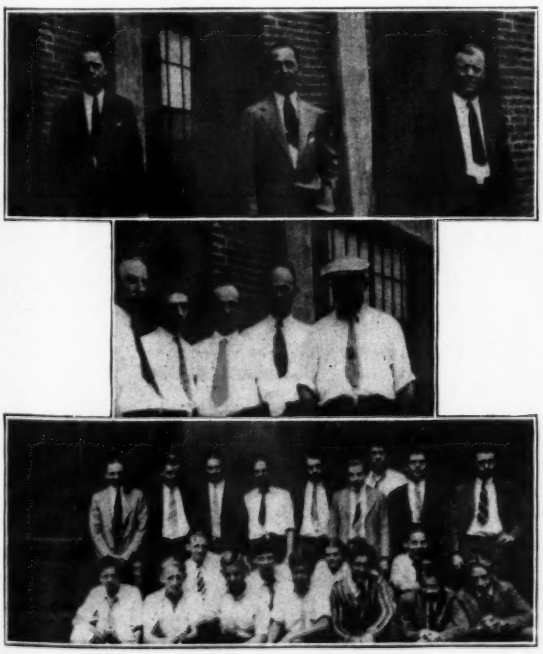
Heretofore the board of directors have been holding office by virtue of their appointment by the president. Commencing this year, they are now elected by the membership-at-large. The board now consists of the following men: Robert Duncan, William D. Evans, Max H. Finzel, Joseph H. Jevons, Arthur Johnson, David Minoggio, N. J. Previati, B. T. Schullerts and Gus Thaler, Sr. The Alameda County Association has a membership of 62. During the year just closed seven new members were added.

◆

Vocational Class Visits Baltimore Plant

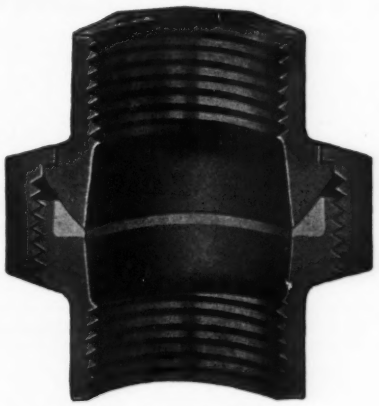
The Plumbing Vocational School class of Baltimore, under the direction of their instructor Mr. Leroy S. Nicholson, made a tour of inspection of the plant of the Standard Sanitary Co. in that city.

Accompanied by G. J. Fitch, chief plumbing inspector of Baltimore, and John W. Clark, executive secretary of the Association of Master Plumbers, the boys left at



Top row: Mr. Nicholson, instructor of vocational class; John W. Clark, executive secretary, Association of Master Plumbers; George I. Fitch, chief plumbing inspector, Baltimore, Md. Middle row: J. A. LeMiew, E. L. Crosby, R. B. Fulton, F. E. Lang, J. M. Weaver, all of the Standard Sanitary Manufacturing Co. Bottom row: The vocational class

IMICO UNIONS



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Made of Refined Malleable Iron with Brass Seat Inserted in Place by Powerful Pressure So That It Cannot Become Detached.

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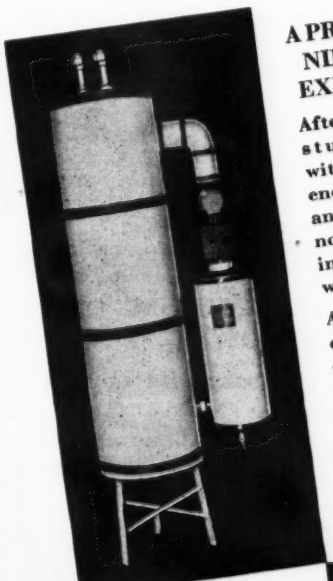
Chicago, Ill.
Manufacturers Full Line Iron Pipe Fittings



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Almost 100% efficient and practically foolproof we offer it for sale through the plumbing trade.

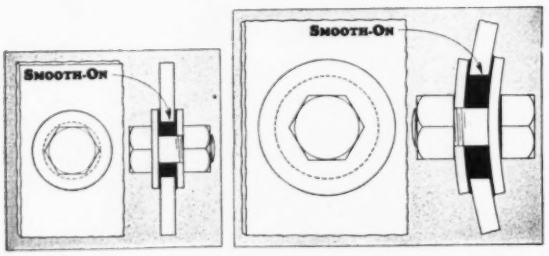
Any plumber can sell it with absolute confidence.

The New Wessels Electric Water Heater

D. D. WESSELS & SONS CO.
DETROIT, MICH.

Electric Wessels QUALITY WATER HEATER

To make a pressure-tight closure at a hole through cast or wrought metal



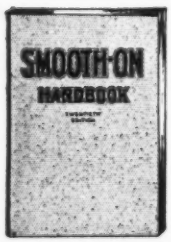
NOTHING could be easier. Get a heavy bolt, two washers and some Smooth-On No. 1. Put one of the washers against the bolt head, locate as in the diagram, fill the void with an over quantity of a stiff putty of Smooth-On No. 1, slip the other washer over the bolt and pull down the nut to squash the Smooth-On hard against the washers and the edge of the sheet. Expansion of the Smooth-On in hardening makes the whole assembly one solid mass. Subsequent pressure on either side of the sheet—no matter how much—would only make the seal tighter if greater tightness could be possible.

If the hole is too large for readily obtainable washers, two discs cut on a lathe can be made to meet any requirements, and if the sheet surface is curved, shaping the washers or discs to the same contour takes no great effort. In closing a very large hole, a number of bolts may be used, and the cost is only a fraction for that of a riveted seal which would be no tighter.

The first job of this kind that came to our attention was the blanking out of tube holes in a vacuum pan, but the same idea can be applied to openings of any size even up to that of big handholes, and by selection of judicious thickness of the two patch covers, the strength can be made greater than that of the surrounding metal.

Hundreds of equally simple, practical *and permanent* repairs can be made with Smooth-On No. 1. To know more about countless other good power plant applications, send for and read the Smooth-On Handbook.

Buy Smooth-On No. 1 in 1 or 5-lb. can or 25, 50 or 100-lb. keg from your nearest dealer, or if necessary, direct from us.



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8:30 in the morning with R. B. Fulton from the Standard Manufacturing Co. on a bus provided for them by the company and went direct to the plant, where they were met by J. A. Le Mieux, E. L. Crosby, T. E. Lang, H. J. Cooper, J. M. Weaver, and Jesse Higbee. Mr. Nicholson introduced each boy to these officials and they were then divided into groups of five, and each group headed by one of the members of the company, started on the inspection of the various operations of the plant.

Throughout the tour the officials in charge of the groups explained each step in detail and all questions asked by the boys were answered, and wherever possible a practical demonstration was given. At the conclusion a luncheon was served by the company, and on behalf of the class, Mr. Nicholson expressed appreciation of the opportunity presented to the members in permitting them to visit and inspect the plant.

◆

Baltimore Plumbers Back, Health Commissioner

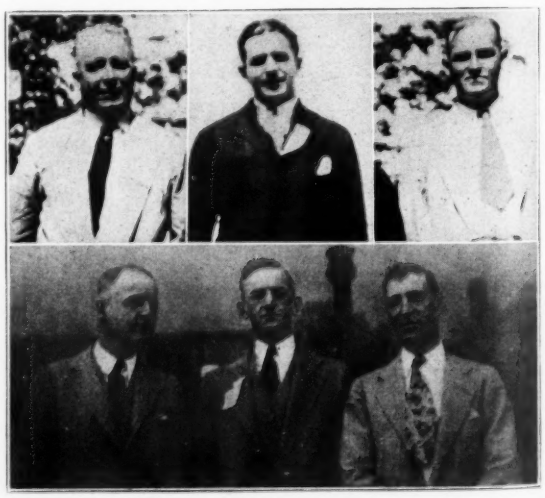
The proposed ordinance enacting a new plumbing code for the city of Baltimore was introduced in the city council by Howard Bryant, president. He announced that it was sent to him by Mayor Broening, with the request that it be passed before the summer recess. It was referred to the committee on police and jail.

When this committee takes up the proposed ordinance it is expected that an old fight will be revived to have the plumbing division of the health department removed from that Department and placed under the head of the bureau of buildings.

"All plumbing work belongs in the bureau of buildings," Chief Hammond of the Buildings Department asserted. "It is mostly an engineering function," he said.

On the other hand, Health Commissioner Jones maintained that plumbing is solely a matter of sanitation and is so closely associated with health work that he will be opposed to any change on these grounds.

This same controversy arose a few years ago when the

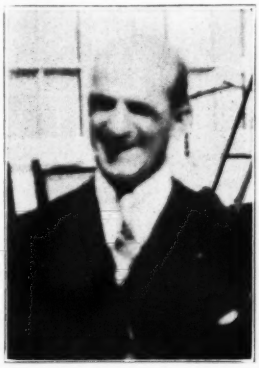


Top row: P. J. Murphy, Pittsburg Water Heater Co., New Orleans; L. A. Beaudoin, American Brass Co., New Orleans; S. E. Smith, American Radiator Co., New Orleans. Bottom row: F. Smith, manager Wolff Co.; H. E. Walters, manager Crane Co.; H. Fremaux, manager Standard Sanitary Mfg. Co., all of New Orleans. Photos taken at the convention of the Louisiana-Mississippi Plumbing and Heating Dealers

engineering departments of the city were reorganized, but Dr. Jones with the help of the Association of Master Plumbers successfully fought to keep the plumbing division in the health department, and will again oppose any attempt to affect such a change because of the excellent service being rendered by the plumbing division in its present position, and the fact that they believe plumbing is entirely a matter of health protection.

◆

J. V. Young Heads Plumbing and Heating Club



J. V. Young

The affairs of the Plumbing and Heating Club of San Francisco and the bay cities will be directed during the coming fiscal year, which began July 1, by J. V. Young of the Gilley-Schmid Co., San Francisco, who succeeds Howard W. Finch as president. The new vice president is F. F. Elliott of Crane Co.; the incoming treasurer is Benjamin F. Blair of the Standard Sanitary Mfg. Co.

Following the customary manner of choosing their officers, the new incumbents were elected by the board of directors, which convened at the Elks Club in San Francisco on July 1. This was the first meeting of the directing board since three new members were selected at the last general meeting, all board members but one being in attendance.

◆

Boston Master Plumbers Discuss Credit Program

The first meeting of the newly organized credit committee, formed to discuss methods for the correction of conditions in the plumbing and heating trades in the Boston merchandizing area was held in a private dining room of the Chamber of Commerce on Tuesday evening, June 25.

After disposing of an excellent dinner, the committee proceeded to get down to business, its first act being the election of Harry Starr of the W. H. Gallison Co., wholesalers, as chairman. W. H. Oleson, manager of the Heating and Piping Contractors Boston Association, Inc., presented a plan for research formulated by Herbert A. Snow of Buerkel & Co., one of the contractors' representatives. In addition Mr. Oleson told of hearing the author of the Biddle Plan speak in St. Louis and outlined what the Allied Construction Industries Bureau is doing in Detroit and other cities. Mr. Starr, who is chairman of the credit committee of the Sanitary Research Bureau and is also active in the Wholesale Trades Credit Bureau, outlined what these two bodies are doing toward the elimination of present deplorable conditions, presenting for the first time two new steps toward group co-operation which have just been decided upon by directors of one of these bodies. charging of interest to contractor debtors whose accounts are more than sixty days in arrears was discussed by those present, as was a co-operative

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JUSTIFY a good reputation by installing Hutchison Vapor Heat. Simple—Inexpensive—Efficient.

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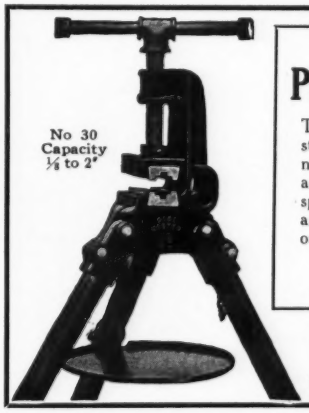

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The Pipe Master is a compact strong vise and stand combination offering many added advantages. The vise is high speed adjustable and the jaws are so designed as to hold without cutting or marring the pipe.

Write and ask us about our interesting free trial offer.

SPENCER REGULATOR COMPANY
SALEM - - - MASS

Raising RED RING to hook on wall plate upstairs, lights heater in basement. Dropping RED RING shuts off gas. POSITIVE ACTION.

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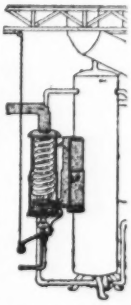

ARROW TRADE MARK

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STEEL TANKS

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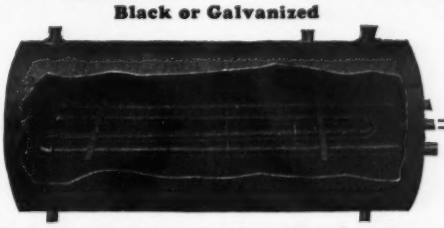

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Sheer Comfort = Electric Room Temperature Control

Dealer's Price, $22.75
Consumer's Price, $48.00 Installed

H. M. SHEER COMPANY
Dept. D E Quincy, Ill., U. S. A.

Sump Pumps . . . NO SERVICING

Correctly powered with ¼ H. P. repulsion induction G. E. motors, Taber Sump Pumps require no servicing after installation because of in-built quality.

¶ Write for descriptions and prices.

See Page 909 Domestic Engineering Catalog

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TABER PUMP CO. *Est. 1859*
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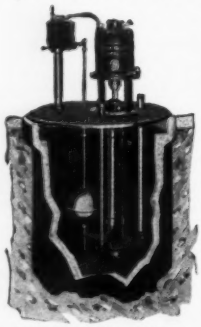

Fig. 194 aG Taber Midget Sump Pump

WARNOCK

Warnock Wrenches can be adjusted in a jiffy. Just put it on the pipe, pull the strap tight and bear down. That's all there is to it. They never slip either.

Write for our catalog showing sizes and prices
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TANKS

PRESSURE SPECIAL
BLACK & GALVANIZED
RIVETED & WELDED

PENNA. RANGE BOILER CO.
24th and Washington Ave., PHILADELPHIA

Top row: D. A. Mayfield, president of Jacksonville association; F. Spencer Fromberger of Daytona Beach; Walter Edelblut, past state president, Fort Myers; F. P. Jones, Dunham Co., Jacksonville. Middle row: H. A. Moore, G. C. Odum, J. Goldenburg, all of Daytona Beach; R. M. Cunningham, vice president, New Smyrna; V. C. Grant, Daytona Beach; Charles Galler, president, Daytona Beach, all of Halifax Master Plumbers' Association. Bottom row: C. F. Armstrong, Henry Armstrong, L. R. Armstrong and G. D. Armstrong, inspector, all of Bradentown. Photos taken at the convention of Florida State Association of Master Plumbers

effort to establish machinery which would make standardized credit terms feasible.

In view of the tremendous amounts of money due to jobbers in past due accounts, it was felt that the time was not yet ripe to apply the Biddle Plan or a similar method, but all efforts of the committee are to be devoted toward the eventual establishment of some such definite credit program.

Besides those mentioned there were present Thomas O'Callaghan, president of the Heating and Piping Contractors Boston Association, Inc., Maurice E. Chase, and H. E. Whitten, also members of that association, John Slattery, Boston manager for the Crane Co., John J. Downey, representing the Boston Master Plumbers Association, and Robert Scott in charge of credits for the Boston branch of the American Radiator Co. Mr. Starr represented the wholesalers of plumbing goods, Mr. Slattery the jobbers of heating materials, and Mr. Scott the boiler and radiator manufacturers.

◆

Urge Attendance at State Outing

The members of the Salt Lake City, Utah, Association of Sanitary and Heating Engineers were requested to keep August 17 open for the annual outing sponsored by the Utah State Association of Sanitary and Heating Engineers by Joseph F. Carthey at the regular meeting held July 11. As the state organization is planning an extensive program of athletics and entertainments, Mr. Carthey also suggested that a five-day week be adopted that week so that the entire day might be devoted to the outing, which will be held at Lagoon. Mr. Carthey is a member of the committee in charge of the outing,

and of the state board of governors, as well as of the Salt Lake association board.

President Parley G. James presided at the meeting and made his report of the national convention. He stated that the manufacturers' exhibit was the largest and finest that he had ever seen, and fully lived up to its advertisement of a "million dollar display." He further said that he attended every lecture and session, and that the meetings were of great educational value. The value derived from attending the convention could hardly be overestimated, he said.

The representatives of twenty-one firms were in attendance at the meeting. It was reported that Ralph D. Evans and E. G. Harris, both past presidents of the organization, were on vacation trips to California, and that John Rasmussen was enjoying the scenery in Missouri. Only one meeting will be held during July, it was decided at the meeting. The next convening of the association will be on August 1.

◆

Made New York Certified Heating Manager

M. E. Durkee has been made manager of certified heating by the Heating and Piping Contractors New York City Association. Mr. Durkee, for two years prior to this appointment, held a similar position with the Heating and Piping Contractors Association of New Jersey. He is a graduate engineer of Pratt Institute of Engineering and has had wide experience with the General Electric Co., having been one of its engineers in the department which deals with the application of turbines to ship propulsion and in the commercial engineering branch as a general engineer in connection with the application of General Electric apparatus to power plants. At the conclusion of his eighth year there Mr. Durkee engaged in sales engineering work.

◆

Captain Wayne F. Carbis, assistant manager of the K & K plumbing Co., Salt Lake City, Utah, has left for a three weeks' encampment in California with the Fortieth Division.

Obituary

John J. Halloran

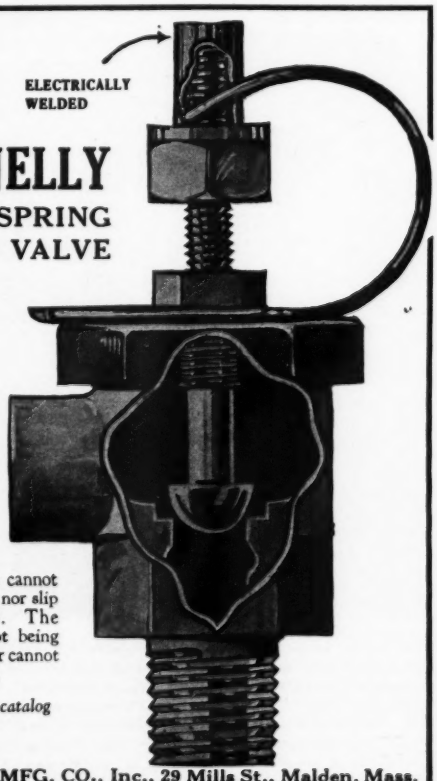
John J. Halloran, plumbing contractor of New York City, died recently at his home, 294 Wadsworth avenue, following a long illness. He was born in Ireland, but had lived in New York since childhood, and was in his sixty-fifth year.

William H. Werst

William H. Werst, formerly president of the H. W. Werst Plumbing Co., Louisville, Ky., died suddenly on the night of June 25, of heart trouble, at his home, 619 Woodlawan avenue. The funeral was held on Friday morning, June 28. He is survived by two sons, Cyril and William; two daughters, Mrs. Arthur Bowman and Miss Lilliam Werst; three sisters, Mrs. Peter Getig, Mrs. Albert Charlton and Mrs. Raymond Barrett; and three brothers, Henry J., and Charles F. Werst, of Lexington, Ky.; and John J. Werst, of Evansville, Ind. He was a son of the late Henry W. Werst.

ELECTRICALLY WELDED

DONNELLY
OUTER SPRING RELIEF VALVE



With the Donnelly Outer Spring Valve, pressure relief is made an automatic operation. This valve is so constructed that it cannot fail in operation nor slip in adjustment. The outer spring not being exposed to water cannot corrode or rust.

Write for our catalog today.

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for Industrials—Power Plants—Water Works
for the Building Industry
for All Services

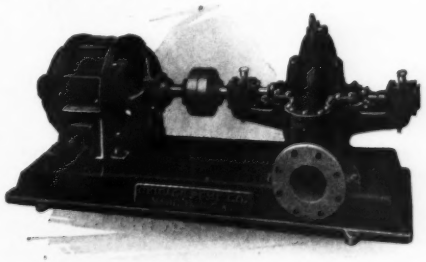

Fig. 1881 Type D—Single Stage Pump

Horizontally Split, Sizes 1½" to 6"
Capacities up to 2,000 G. P. M.

Ball Bearings
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Ask us for prices and information on your next centrifugal pump job

CHICAGO PUMP COMPANY
SEWAGE-CONDENSATION-CIRCULATING
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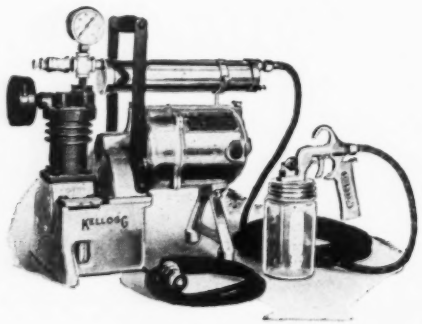
Representatives in all principal cities

You Can Do Paint Spraying Anywhere *with a* KELLOGG NO. 1



Radiator tubes, pipes, heating plants, and similar objects can be painted any place with this Kellogg No. 1 Outfit.

It is driven by a universal motor which can be plugged into any 110-volt lamp socket. The outfit weighs but 36 pounds and is as portable as a can of paint and a brush but will do two or three times as much work and do it better.

Complete in every detail and low priced, you will be surprised how rapidly this outfit will pay for itself.

Consists of:

Model EM-281-UX Compressor with 110-v. Universal Motor Type F Fan and Round Spray Gun.

15-ft. length of ¼-inch air hose and fittings.

Price Complete

$99.95

Ask your jobber or write us for details

KELLOGG MFG. CO.
Rochester, N. Y.

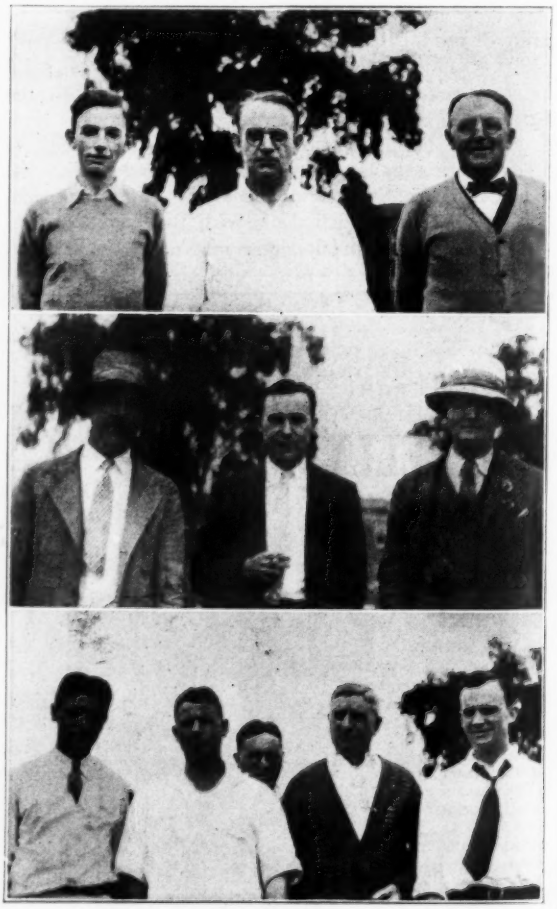
KELLOGG COMPRESSORS

Letters to the Editor

The Plumbing and Heating Students at Carnegie Institute of Technology

Editor, DOMESTIC ENGINEERING:—The scholarship boys attending the Carnegie Institute of Technology, who are in their third year in the plumbing and heating course, have completed their junior year successfully with one exception.

One of the major themes of my various lectures and one of the major thoughts that I endeavor to impress upon the young men, who attend this course, is that of entering the contracting business upon their completion of this engineering course. With this in view the course includes economics, accounting, commercial law, employment problems, and estimating. All these subjects are of vital interest to the business man. In addition to these business subjects the engineering subjects taken are mathematics, physics, mechanics, chemistry, electrical engineering, hydraulic engineering, sanitary engineering,



Top row: Robert Robertson, Robert Robertson, Jr., Robert Robertson, Sr., three generations of Robertsons, now members of Robert Robertson Co. of Beverly. Middle row: A. L. Gustafson, Holyoke Heater Co.; Joseph Fitzsimmons, Kennedy Valve Mfg. Co.; Martin Brennan, manufacturers' agent. Bottom row: T. J. Swan, Hoffman Specialty Co., Boston; George Burke, McAuliffe & Burke Co., Boston; M. H. Monks, New York City; John McAuliffe, McAuliffe & Burke Co., Boston; R. V. Simpson, of Boston. Photos taken at the outing of the Massachusetts Sanitary Club

strength of materials, pumps, compressors, refrigeration and power plants.

These important subjects are all typical engineering subjects and mastering them trains the students' minds strictly on the theory and design of plumbing and heating equipment and systems.

The technical subjects such as pipe shop, plumbing codes, drawing, heating, bacteriology, building sanitation, and mechanical equipment of building, and research problems are studied, for the purpose of focusing their engineering work on the plumbing and heating industry. Some practical work is given but it is necessary to limit that to a minimum in order to emphasize the importance and the grasp of plumbing and heating design. However, there must be some practical work given so that the students may properly apply estimating and plumbing and heating layout work. In the final semester research problems are given, having in mind the application of the four years' work to one particular plumbing or heating problem.

This really amounts to a thesis and brings out the originality of the student as well as his ability to apply the four years' training.

In addition to the engineering, the business, and the technical side of the industry, subjects which have to do with cultural development are also included, such as English, industrial history, American government, psychology, and English literature.

The young men who enter this course, which is highly specialized, should have a firm conviction before they start that they wish to make their life work part of the plumbing and heating industry. Those who are not in full accord with this idea find themselves very restless and ultimately drop out because of lack of interest.

It is interesting to see these young sons of plumbers at work in the chemistry laboratory, hydraulic laboratory, and plumbing and heating shops, and in their classrooms. It is also inspiring to think that the teaching of plumbing and heating as such is given on a campus of an engineering school.

It is now beyond the experimental stage, and in the future I can see a rapid movement in developing the department as various difficulties are gradually being ironed out.

Yours very truly,

SAMUEL E. DIBBLE,
Ahrens Professor of Plumbing,
Heating and Ventilating.

◆

From a Letter from Japan

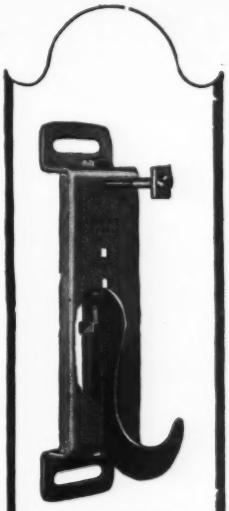
The excerpts from a letter from the Kobe, Japan, representative of Sulzer Brothers, Winterthur, Switzerland, call attention to an error in the May 4 issue of Domestic Engineering regarding the article entitled "Electric Vapor Heating in Germany": "It is incorrect to mention that the combined working of electric boilers with heating systems has been applied in Germany. As a matter of fact, this idea originated in Switzerland during and after the great war on account of coal shortage. Sulzer Brothers are the original publishers of some of these data (referring to the article on electric vapor heating)—especially the pictures are taken from our Technical Review."

You can't overlook this fact

Time saving means money saving and when we say that Moore Radiator Hangers are time savers, we know, from the experience of many years, that we are giving you a fact —not a promise.

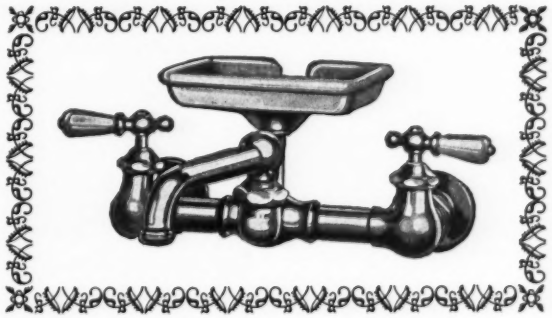
The next time you're at your jobber's, ask him about the Moore line of Radiator Hangers. Look them over. Just a look at them is enough to prove to you their remarkable simplicity.

CARTY & MOORE ENGINEERING CO., (INCORPORATED)
611 West Larned Street
Detroit, Michigan



One Column Hanger

MOORE RADIATOR HANGERS



THE new S & K FIVE ONE FOUR Swing Spout Kitchen Sink Faucet is a decided advance in making the kitchen sink neater in appearance and more efficient.

The FIVE ONE FOUR is designed for the **"new Eight-Inch Back Sinks."**

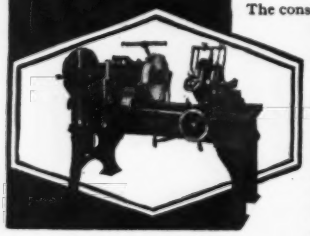
They are well balanced and of pleasing design **(not massive and ornate as some others).** They are exceptionally well made and are priced very low.

You'll want to install the S & K FIVE ONE FOUR just as much as your customers will want to buy them.

Write us for Sample and Prices

STREET & KENT MFG. COMPANY
1954-64 Clybourn Avenue, CHICAGO

Specify
JARECKI
Pipe threading Machines
For Triple Guarantee of Value



The consistent use of Jarecki Pipe Threading Machines by such companies as the New York Central, Pennsylvania and C. B. & Q. Railroads is your guarantee of correct design.

The repeat business that this product enjoys (amounting to over fifty per cent of the total production) is your guarantee of dependable and economical production.

The variety of models and sizes available (twenty-two styles with a size range of one-quarter-inch to twelve-inch, and adapted to any desired type of drive) is your guarantee of a machine exactly suited to your requirements.

Backed by seventy-seven years' experience, Jarecki Pipe Threading Machines are everything that *good* pipe machines should be.

JARECKI
MANUFACTURING COMPANY
Erie, Penna., U. S. A.

FROM the beginning, the makers of Enterprise Brass Goods have recognized the importance of care to every detail of the design and construction of their line of plumbers' brass goods.

Because of their never-ceasing watchfulness for the new and better methods of doing things, and of meeting your demands, they have rounded out a line of plumbers' brass goods which has won the respect of plumbers everywhere.

Enterprise products are made for you and your customers . . . for your profit and satisfaction and they meet these requirements perfectly.

Enterprise Brass Works
Muskegon : Michigan

Piping Problems in a Pineapple Factory

(Continued from Page 58)

Literally miles of 8-inch water pipe for underground sprinkler mains surround the various units of the plant, to which 5-inch and, in some cases, 8-inch risers are connected for outside hose connections and the overhead sprinkler lines.

Ventilating and Heating by Nature

In a land where springtime zephyrs blow through the twelve months, Hawaiian pineapple canneries find themselves partially compensated for difficult plumbing problems when it comes to such things as heating and ventilation. The first will doubtless never have to be considered, and as for ventilation, open windows facing the mountains admit the cooling trade winds.

A battery of eight boilers furnish the steam requirements of the plant. The boilers are rated at 750 h.p. each and can be operated up to 200 per cent of their capacity. Fuel, of course, is oil. The boiler house is built to hold a duplicate of the present installation when growth may require.

Modern Accounting, Simplified

(Continued from Page 56)

"Sundries" columns, a summary must be made at the end of the month of all amounts chargeable to the same number, and these summarized totals are then posted to the corresponding accounts in the General Ledger.

The reader may recall that from the Accounts Payable register, or the Combined Cash-Journal form, we found the individual amounts to post to the vendors' individual accounts in the Purchase ledger, and to the individual customers' accounts in the Accounts Receivable ledger. In both cases these amounts were charges made by us, or charges against us. From the Cash-Journal we find the individual items of payments made to us, and payments made by us. For example, surveying the specimen entries on Form "C" for instance, we find in the Accounts Receivable column, a total of $1,900 charged to customers, and a total of $1,440 paid by customers. This leaves a balance still due to us from customers, amounting to $460. These actual figures at the end of the month would appear in the "Accounts Receivable" control account in the General Ledger, and it is this account which reflects, immediately, the total of money due to us on account of work done for customers. But as explained in previous articles, this total is also distributed among a number of individual customer accounts in the Customers' (or Accounts Receivable) ledger; and the total of the balance in all these individual accounts would be $460 as shown in the controlling account.

May I again emphasize the wonderful convenience of controlling accounts and the amount of time they save to the master plumber and to the bookkeeper. In addition to this, they furnish a double check which

is most valuable and contributes greatly to the confidence which the plumber can place in his accounting records.

At the time of writing, inquiries from interested readers are beginning to come in and I will give prompt attention to these, sending personal replies in each case; and where the subject seems to be of general interest, these replies will be published through the pages of DOMESTIC ENGINEERING for the benefit of other readers who may be experiencing the same problem with their bookkeeping.

Plumbing Code Tabulations

(Continued from Page 68)

In this tabulation we have not included those states not represented by at least three cities.

Average Date of Enactment or Last Revision of Plumbing Codes of Cities of Various States

Alabama	1922	Missouri	1922
California	1923	Nebraska	1922
Colorado	1918	New Jersey	1920
Connecticut	1923	New York	1919
Florida	1923	Ohio	1921
Georgia	1924	Oklahoma	1921
Illinois	1923	Oregon	1916
Indiana	1926	Pennsylvania	1921
Iowa	1923	Tennessee	1923
Kansas	1917	Texas	1922
Kentucky	1924	Virginia	1922
Massachusetts	1923	Washington	1922
Michigan	1922	West Virginia	1921
Minnesota	1920	Canada	1921

We do not know that this analysis shows any one section of the country making better progress respecting plumbing codes than any other, but each one is at liberty to draw his own conclusions.

Oregon, Kansas and Colorado appear to make the poorest showing, but we shall not be surprised to see later information change their standing.

New York, New Jersey and Minnesota make the next poorest showing. The New York and New Jersey averages ought to be particularly correct, as these two states supplied 31 and 46 codes respectively.

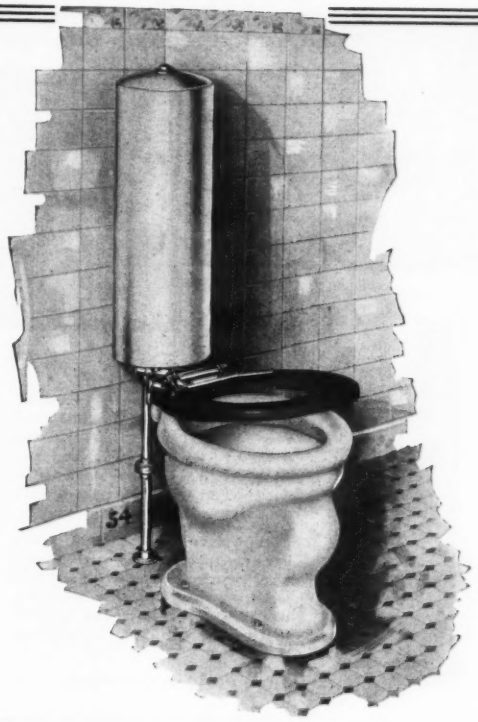
It should be pointed out that in several instances the average of a state is pulled down appreciably by the exceedingly ancient date of one or two cities.

We intend to make the tabulating of our 400 plumbing codes a very comprehensive and thorough undertaking. That being the case, we fully believe that every city and town will want to be correctly represented in our tabulations, and will see that this result is attained by promptly sending to DOMESTIC ENGINEERING their latest information.

We shall be very glad indeed also, to receive suggestions as to desirable subjects for tabulation.

We might add further, that as we go into the tabulation of the various subjects and practices that we have in mind, we shall give consideration to many unusual or especially valuable practices appearing in our tabulating work. Moreover, we expect also to take up in any way that seems advisable, the general subject that is being handled.

The first of these tabulations will be undertaken in an early issue.

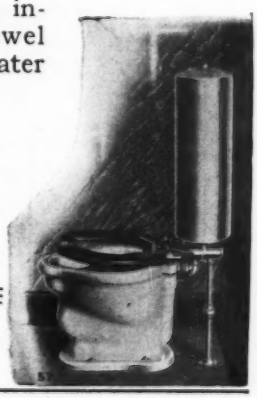


It's a Member!

When your jobber shows you a closet and says, "It's a member of the Bowlus Jewel Auto Pneu Matic line," he's said all there is to be said for quality, workmanship and serviceability.

In those installations where usage is going to be roughest is where Bowlus Jewel Auto Pneu Matic equipment is specified by leading architects and contractors.

Bowlus Jewel contractors never have a service worry in the world. You don't need to have them either. Give your customers — and yourself — the freedom from troublesome equipment by installing Bowlus Jewel Auto Pneu Matic Water Closets.



The BOWLUS MFG. CO.
SPRINGFIELD OHIO

★ *The Cure for Flooded Basements*

The STARK★
PORTABLE ELECTRIC DRAINER

Here is a fact:

flooded basements everywhere are creating a huge demand for a reliable, automatic drainer which can be depended upon for complete drainage service, under all conditions.

Merchants and home owners everywhere need and want the Stark Portable Electric Drainer and you're passing up real profits when you're not selling and installing Starks.

From your jobber.

The Stark Pump Co.
17128 Mt. Elliott Ave. Detroit, Mich.
Branches: Chicago, Philadelphia
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Beaton & Corbin Floor and Ceiling Plates are distinguished by their:

STURDY CONSTRUCTION—
FINE FINISH—
EASY APPLICATION—

Look for the box with the red band

The Beaton & Corbin Mfg. Co.
Southington :: :: Conn.

BEATON & CORBIN
FLOOR AND CEILING PLATES

Making Attractive Proposals

(Continued from Page 76)

heating portion, except with the temperature guarantee omitted.

Combining all the foregoing into a letter to the Building Committee of the New Community House (for instance) the letter would read something like this:

The Letter

August 29, 1929.

The Building Committee
of the New Community House,
City, State.
Gentlemen:—

We propose to furnish and install a complete system of plumbing and heating in the building located at 149 John street, the work to be complete ready for owner's use except that no chimney, street connection, and oil burner are included.

The heating system will be a one-pipe gravity steam system with a circuit main and wet return. Single pipe risers will be carried up to and will be connected to the inlet of each radiator.

Boiler to be supplied will be a No. 110 of Blank make with 7 sections and complete with automatic regulator, water column, gauge glass, try cocks, steam gauge, safety valve, grates and drain cock. Boiler will be of 800 square feet rating and is guaranteed to be of sufficient capacity to maintain steam pressure on the system without undue forcing. Boiler will be connected to chimney with smoke pipe of No. 18 gauge galvanized iron with hand damper and cleanout door.

Radiation throughout will be of the tubular type with legs as manufactured by Blank Company, where concealed brass radiators are required such as in parlor, sun porch and library rooms they are included in price given.

All radiators will be supplied with nickel plated brass radiator valves of Blank make on the supply end and with Blank Company's automatic air valves on opposite end.

All pipe will be best quality black merchant steel pipe with black cast iron screwed fittings to which may be

Top row: Warren Barr, George H. Matthews, Frank E. Pearson, William F. Knauss. Bottom row: H. H. Diedesch, F. A. Zimmer, Paul Jacoby and E. C. Wagner. Photos taken at the Chicago Plumbing Contractors' meet at Big Oaks

added that all lines will be run concealed and basement steam main in cellar will be covered with 1 inch of asbestos pipe covering. Boiler will also be covered with 1 inch of plastic asbestos with hard plaster finish. All exposed piping and radiators in finished rooms will be painted with one coat sizing and one coat of silver or gold bronze.

All pipes entering or leaving floors or walls will be provided with nickel plated wall and floor plates and sleeves.

All work is guaranteed against any and all defects of workmanship and materials, not due to natural wear and tear for a period of one or two years. We also guarantee that when properly operated this heating system will maintain a temperature of not less than 70 degrees Fahr. with an outside temperature of zero and no wind or with wind blowing not to exceed 15 miles per hour.

We also propose to install a complete system of plumbing ready for owner's use consisting of hot and cold water supply, drainage and vent system, and gas piping. We have not included a street connection.

The drainage system will be arranged to flow by gravity to the street sewer with soil and vent stacks extended up through the roof. All work will be carried out to meet the requirements of the local plumbing code. Drainage piping will be extra heavy cast iron and water piping will be first class standard weight galvanized steel pipe with galvanized fittings.

The plumbing fixtures to be installed will be first class in every respect and will consist of :—

Two water closets with vitreous china bowls, white seats, and covers vitreous china flush tank, china bolt caps with all trimmings of nickel plated brass with white china handles Blank plate No. 150.

Three lavatories, vitreous china high back, 18 inches by 21 inches, four ball faucets, P-trap to wall, supported on concealed wall hanger with all trimmings of nickel plated brass with white china handles Blank Plate No. 28.

Two bath tubs of built-in type, enameled iron, 5 feet 0 inches in length, with shower over, and nickel plate brass trimmings with white china handles, Blank Company's Plate No. 150.

One kitchen sink, integral high back, enameled iron, 36 inches long, P-trap to wall, combination faucets with swing spout, supported on concealed wall hanger and with all trimmings of nickel plated brass.

All hot water lines will be covered with 1 inch of asbestos pipe covering.

Work will be guaranteed under the same guarantee as given for the heating system.

Very truly yours,

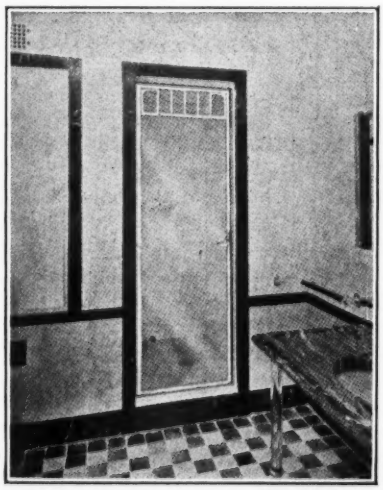
John Smith & Son.

Per.....

Sketches and Illustrations

Another thing which always serves to attract attention to a proposal is one or two neat sketches showing the contractor's idea as to how he proposes to install the work. These sketches should be clean and neat and must be made as simple as possible so that the ordinary person can grasp their meaning. For this purpose there

ADJUSTABLE
SHOWER-STALL DOORS



Pat. Oct. 21, 1926

We furnish Shower-Stall Doors, Bath-tub Shields and Partitions in standard sizes or make them according to specifications.

Illustrated booklet will be forwarded upon request

G. M. KETCHAM MANUFACTURING CORP.
83 Washington St. :: Brooklyn, N. Y.

HESSLER ROOF FLANGES

Ask Your Jobber to Supply You

Your jobber is your convenient source of supply for Hessler Roof Flanges. He has them because they are so popular with the men who know. And the reason they're popular is because they don't have to be cut or fit. Simply hammer them into place and they're there for good—leakless always.

H. E. HESSLER CO.
Syracuse :: New York

COUPLING FIG 1002 C
for
COPPER TUBE PLUMBING
only
3 FITTINGS
TEE
UNION FIG 1001C
ANDERSON COUPLINGS
In this drawing, showing typical joints in a Copper Tube Plumbing Installation, it is easy to note that only Three different type Anderson Couplings are necessary for the entire job.
Save money—save time—do better work. Sell Copper Tube Plumbing and Anderson Couplings.
Write us for catalogue.
UNION FIG 1001 C
TEE
COUPLING FIG 1002 C
TEE
UNION FIG 1001C
THE CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD - MASS

is nothing better than the so-called isometric which is usually made in the form of an oblique projection.

It is not necessary to show the whole installation in such sketches as this often would involve a great deal of labor but some little part such as the method of connecting up an indirect hot water heater to a hot water tank (see Fig. 1.) or a sewage ejector to the drainage system (see Fig. 2.) is the kind of thing which will do much to arouse the interest of those in control.

By all means make such sketches up in attractive form; an old piece of brown paper with lead pencil lines which are hard to see is not the thing at all. A small sheet of clean white paper with sharp clear lead pencil lines clearly designated with explanatory notes and arrows is the kind of material which is going to receive consideration.

The two things to be kept in mind in making a proposal is to make it interesting and attractive and not to worry about the price as long as it is not an exorbitant figure. People are willing to pay for service up to a limited extent and the object of the proposal is to tell them what the service will cost and then to convince them that you are the contractor who is going to give them the best service and, therefore, the best job.

Tops and Bottoms of Service Risers

(Continued from Page 72)

it will open at the slightest tendency of the water to circulate. In other words, when a check is installed on the horizontal, the lifting of the tongue exerts a certain resistance to the hot water circulation and by putting the check on a line sloping down

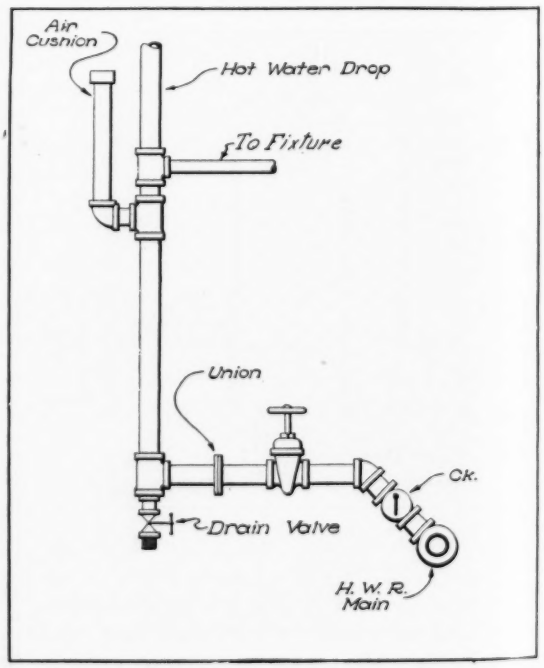


Fig. 10.—Typical bottom termination for down-feed hot water riser

at 45 degrees, as indicated in the drawing, practically all of this tongue resistance is resumed.

Other schemes, used on these checks, are to require aluminum flappers, which are very light, and to use special checks in which the flapper in a closed position hangs at a 60-degree angle instead of a 45-degree angle.

The method shown in the sketch, however, does not require anything special for the check valve, an ordinary standard check being employed.

Heating Plant Maintenance

(Continued from Page 74)

middle of the gauge glass or slightly above the middle.

(b) Build the Fire (same as before).

(c) Open All Drafts until the steam penetrates all portions of the system and every radiator is heated. Then set the regulator to limit the pressure to —— oz., or as directed by the contractor.

(d) See That the Air Relief Valve is functioning and allowing the system to relieve itself of air as fast as it fills with steam.

(e) To Bank the Fire (same as before).

(f) Keep the Ash Pit Clean (same as before).

(g) Closing Off For Summer (same as before).

(h) Drain Out Dirty Water (same as before).

(i) Finally (same as before).

(j) If You Do Not Understand any of the above directions or if you need help. CALL

JOHN SMITH
TEL. 010101
13th and 14th Ave., City

Gravity Steam Suggestions

With gravity steam the card will be almost identical with vapor steam except that the automatic air valves must be mentioned. A form for discussion is given in outline Number Three.

Outline Number Three

Directions for Gravity Steam Heating Systems

(a) Fill the System (Same as Outline 2).

(b) Build the Fire (Same as Outline 1).

(c) Open All the Drafts (Same as Outline 2 except to set the regulator for 2 pounds.

(d) Examine Radiator Air Valves; these valves should be open and should discharge air when the system is filling up with steam but should close off as soon as the air valve gets hot.

(e) To Bank the Fire (Same as Outline 1).

(f) Keep the Ash Pit Clean (Same as Outline 1).

(g) Closing Off For Summer (Same as Outline 1).

(h) Drain Out Dirty Water (Same as Outline 1).

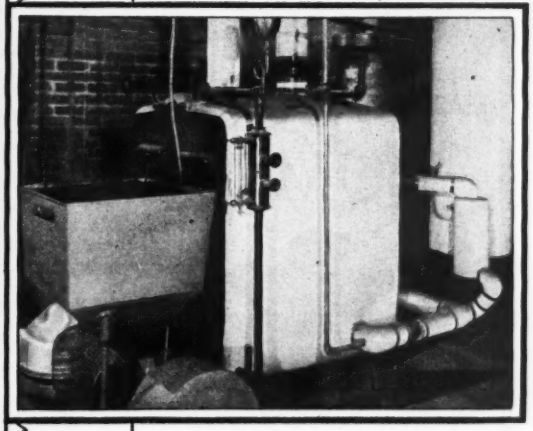
(i) Finally (Same as Outline 1).

(j) If You Do Not Understand any of the above directions or if you need help CALL

JOHN SMITH
TEL. 010101
13th St. and 14th Ave., City

Cleaning Out the Gauge Glass

Gauge glasses are cleaned out with muriatic acid, the trick being to get the acid up into the gauge glass with-



Behind the Profit—The Product. Behind that—SERVICE.

PROFITS cannot last if the products through which they are made, do not stand up. They are soon eaten up by free servicing, adjustments and dissatisfied customers. The product cannot justify the profit unless the manufacturer stands back of it to give you complete — SERVICE.

Every claim made for The ELECTRIC FURNACE-MAN is backed by an organization which has no reputation to make but has an excellent one to maintain.

Complete service and every assistance, either sales or technical, is yours for the asking. Why not let us begin by giving you a complete picture of The ELECTRIC FURNACE-MAN—what it does and how it does it?

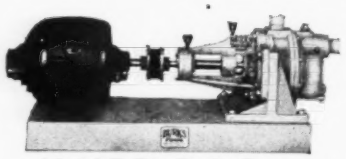
The ELECTRIC FURNACE-MAN burns ANTHRACITE — buckwheat or rice. Used in thousands of homes. Fits any heating plant. Ideal for hot water supply.

The Electric Furnace-Man

PATENTED
AUTOMATIC COAL BURNER

DOMESTIC STOKER COMPANY
Gillespie Building • Seven Dey Street • New York

NOW—a BIG BURKS Super-Turbine PUMP—for Heavy Duty Use



Model D Big Burks Pump

THE Pump the Trade Has Waited For—and Demanded—Is *Here!* : : For years the trade has demanded a *big* pump of the *Burks characteristics*. And now, after thorough tests that have satisfied our strict engineering requirements, we offer

THE BURKS MODEL D

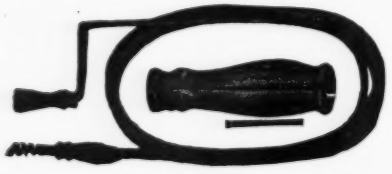
Made in 3 sizes. Balanced Hydraulic Load—600, 800 and 1,000 Gallons per Hour. Has all the engineering features of the smaller Burks Super-Turbine Pump (for Home Water Systems), but *designed for heavy duty*—larger capacity jobs—water supply for factories, hospitals, office buildings, hotels, large estates, etc., also for circulating, booster work, etc.

Note the following features: Only one moving part—no metal-to-metal contact. Pumps air alone to high pressure; or water alone to high pressure; or air and water mixed to high pressure. Has a working pressure of 100 lbs.

Write today for Bulletin No. 88 describing these heavy-duty Pumps

DECATUR PUMP CO. DECATUR, ILLINOIS

COLEMANS
SANITARY SPECIALTIES



Coleman's Flexible Coil Wire Sewer and Pipe Augers should be in every plumber's kit. Giant Revolving Spear Point for loosening and removing stoppages is unsurpassed.

Flat Steel Rods and other tools for removing stoppages from straight sewers or drains.

A closet cleaner of unusual efficiency. You need it. Order from your jobber.

Allan J. Coleman
208 NORTH WABASH AVE.
CHICAGO - ILLINOIS

out removing the glass and going to a lot of unnecessary trouble.

It may be done very simply by putting the muriatic acid in a cup and then closing the bottom cock on the glass and opening the pet cock under the glass with a small amount of steam pressure on the boiler. The water in the glass will flow out of the pet cock owing to the steam coming in through the top gauge glass cock which remains open and the entire glass is full of steam.

Close the top gauge glass cock and insert the pet cock into the acid in the cup. The gauge glass is now entirely cut off from the boiler as both gauge glass cocks have been closed and the steam in the glass will begin to condense and cause a vacuum in the glass. This vacuum will raw the acid up out of the cup through the pet cock. After the acid has remained in the glass two or three minutes the opening of the top cock will allow the vacuum to be broken and the acid will drain back into the cup through the pet cock.

This little trick will save taking out the gauge glass, reinstallation of the glass and the danger of breakage in the process.

Why Enforce Plumbing Laws?

(Continued from Page 76)

comfort, inconvenience, cost of repairs, foul odors, insanitary and unhealthful conditions are the resulting penalties which the unfortunate occupant must pay.

"The plumbing in buildings is not strictly a requirement affecting the safety of the structure, nor has it to do with the thickness of the walls, carrying weight or fire hazards, but it does directly affect the comfort, convenience and health of the occupants, and the installation and supervision should be from the health standpoint and not a building construction standpoint.

"Insanitary conditions in buildings may be caused by the following defects in the construction, installation and ventilation of plumbing and drainage systems and plumbing fixtures:

"Untrapped plumbing fixtures.

"Fixtures with a large amount of fouling area.

"Loss of trap seal by siphonage, back pressure, momentum or capillary attraction, that will emit foul odors from sewers into buildings.

"Leaky and defective pipes.

"Stoppage in waste pipes due to inferior and defective installation.

"Absorbent materials used in fixture construction.

"Fixtures installed in ill-lighted and unventilated rooms.

"Fixtures without a water supply.

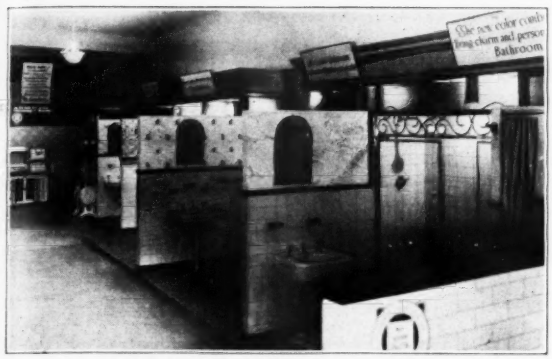
"Part of plumbing fixtures that come in contact with the human body must be as near *fool-proof* as possible.

"Lack of proper cleanouts in the drainage system.

"Plumbing fixtures enclosed or encased in wood.

"Pan, valve, plunger, offset, washout and other water closets having invisible seals or unventilated space, also the dry closet system.

"Walls and floors in rooms containing water



Part of the exhibit of plumbing and heating maintained by The Plumbing and Heating Development League of Philadelphia

closets and urinals that are not constructed of non-absorbent, indestructible material.

"Illegal connection from boilers that will permit the discharge of steam or hot water into a plumbing or drainage system.

"Discharge of volatile oils, such as gasoline, benzine and naphtha into the sewerage system from dye houses and garages.

"Overflows from cisterns used to store water, connecting direct with a sewer or cesspool.

"Connection from refrigerators, ice boxes, floor drains and soda fountains direct with the sewer.

"Plumbing fixtures should never be installed in rooms that are not provided with a window located in the external wall of the building or that are not provided with a system of ventilation that will change the air in the rooms at normal temperature at least six times per hour."

It will be recognized by anyone who looks at the question fairly, that every one of the foregoing is something that can produce an unsanitary condition under which one would not wish to live if it could be avoided.

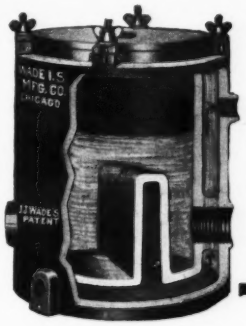
The only right and successful way that we know of, to avoid these wrong conditions is to set up a plumbing code that prohibits them, and having done this, to see that the demands of the code are faithfully and impartially enforced.

By way of emphasizing what intelligent attention to the overcoming of a bad health condition can accomplish under the enactment and enforcement of laws designed to correct the condition, we want to mention a fact brought out at the recent plumbing conference at Carnegie Institute of Technology in Pittsburgh.

In a lecture given by Prof. Harold S. Lang, he showed how the typhoid death rate had been reduced in this country from 46.3 per 100,000 population in 1890 to 5.5 in 1927. Nothing but the enactment and enforcement of laws governing sanitation is responsible for this wonderful improvement in the typhoid situation in this country.

We trust that our presentation of this subject will be helpful in convincing those, who are doubtful, of the need of a good plumbing code and its enforcement. But the best code in the world is worth but little unless there is enforcement back of it.

The Wade Water Jacket Grease Trap



Wade Accessible Drains

affords more cooling area for congealing grease than any other trap made. It is easily identified by its green color.

Wade Iron Sanitary Mfg. Co.
1717 Canal St. Chicago

MEETS EVERY DEMAND YOU CAN MAKE OF IT

Style "C" of the E-Z Hanger group—an improved type of radiator hanger. Consider its advantages.

Suitable for both wall and tube type radiator. Easily, quickly installed. No need for accurate measurements of anchor bolts. Height and lateral variations taken care of. Hanger out of sight. No obstruction of any kind back of radiator.

Shall we send you detailed information? Write today.

EZ RADIATOR HANGER

Made by
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794 Hampden Ave. ∴ St. Paul, Minn.

Style "C"

Also Manufacturers of EZ INSERT

SELL The COMPLETE DURO LINE in '29

Get all the details on Duro, the most complete and profitable line of water softeners, electric water systems, filters and septic tanks on the market. Write for new Duro Catalog and Price Sheet.

THE DURO COMPANY
Dayton, Ohio

PAINE
Flattened End Lag Screws

Made in four sizes and furnished with bolts
¼ x 3 ⅜ x 3½ ⅜ x 4 ½ x 5
Will fit any standard lag screw shields of corresponding sizes
Send for samples and prices
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2949-53 Carroll Ave., Chicago, Ill. 79 Barclay St., New York, N. Y.

Woman's Page

Many organizations of women are actively engaged in bettering sanitary conditions and adding to the attractiveness of the communities in which they live. The home and community department of the Ashland County Farm Bureau is maintaining a rest room with toilet facilities in the courthouse at Ashland, Ohio. Each member is allotted a certain time to see that the place is kept in sanitary condition. Miss N. Marie Wilson, the county demonstration agent, says that this room is maintained, in order to provide a place for holding conferences, and a place for the women from the rural sections to wait for their husbands to finish their errands in town before returning home. The farm bureau is also arranging for a kitchen improvement contest in order to call the attention of farm women to the many modern conveniences for the kitchen.

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A Message from President McAndrew

The following is an excerpt from a letter received recently from Mrs. W. E. McAndrew of Tampa, Fla., newly elected president of the Women's Auxiliary to the National Association of Master Plumbers, in which she discusses the convention of the auxiliary held recently in Buffalo, and tells of her plans for the future of the auxiliary.

"It was a splendid convention, and I feel that too much praise cannot be given the men and women of the Buffalo association and auxiliary for the capable way in which they handled the convention, and it must be some enormous job. It is very difficult for us to realize that our dear Mother Emily Hornbrook has said farewell to the real activities of woman auxiliaries and that she will no more direct the work of our auxiliaries. Her work will be greatly missed, and enough praise cannot be given her for the splendid work she has done in the past nine years. It will be my endeavor to carry out Mother Hornbrook's policies inasmuch as one person can do this in another's stead, and I sincerely hope that I may have the support of DOMESTIC ENGINEERING in this work that is all so new and strange to me. I appreciate that, in paying me the honor of electing me to the highest office of our national auxiliary, they have placed upon my shoulders a very great burden. I shall need the help of all of my friends. May I depend upon you?"

(Signed) MRS. W. E. McANDREW,
National President.

An Appreciation from Mrs. Hornbrook

The Women's Auxiliary to the National Association of Master Plumbers wishes to acknowledge its appreciation of the courteous readiness of the following firms, associations, auxiliaries and individuals to make the eleventh annual convention a precious and happy memory for those who were in attendance: The National Association of Master Plumbers; the Buffalo master plumbers; the Buffalo Women's Auxiliary; the national convention and exposition committee; the Plumbing and Heating Industries Bureau; Standard and Kohler Bands; Crane Co.; Standard Sanitary Mfg. Co.; American Radiator Co.; the Buffalo jobbers; trade papers; and especial mention to Mrs. George Frank, chairman, ladies reception committee.

MRS. E. D. HORNBROOK,
Past President, Women's Auxiliary to the N.A.M.P.

Women's Auxiliary Organized at Utica

Organization of a women's auxiliary of Master Plumbers' Association of Utica was made at a recent meeting of wives and daughters of local plumbers in the clubrooms, 224 Genesee street. Mrs. James Palmer was elected temporary president, and Mrs. Raymond L. Ehrsman, temporary secretary. Officers were to be elected at a meeting July 9 at the home of Mrs. Palmer, 13 Pearl street, New Hartford. This membership committee was appointed: Mrs. W. E. Stradling, chairman; Mrs. W. G. Thomas and Mrs. Thomas Hughes. The entertainment committee consists of Mrs. L. Latterman, chairman; Mrs. Chris Klossner, Mrs. Paul Hamjay, Mrs. Albert M. Obernesser, Mrs. Eugene King and Mrs. Charles Schwab. B.

Top row: Mrs. R. H. Montgomery of Snyder, N. Y.; Mrs. L. B. Davis of Williamsville, N. Y.; Mrs. Harry Ireland of Buffalo, N. Y. Second row: Miss Catherine Slosser and Miss Marie Reimann, both of Atlantic City, N. J.; Mrs. N. McDermott, Mrs. L. McNamara and Mrs. Charles Quinn, all of St. Louis, Mo. Bottom row: Miss Olive Gaudette and Miss Agnes M. Burns, both of Portland, Me.; Mrs. J. M. Hefner and Mrs. E. F. Watson, both of Bareham & Saunders, Rochester, N. Y. Photos taken at recent convention of the National Association of Master Plumbers

Joseph O'Donnell of the Plumbing and Heating Industries Bureau, Syracuse, spoke on "What Women's Auxiliaries Are Doing."

Mid West Sanitary Clubs Holds Last Meeting of Season

The June meeting was the last which will be held this season by the Women's Auxiliary to the Mid-West Sanitary Club of Chicago. An unusually fine luncheon was served at the Graemere Hotel, after which business matters were discussed. As this was the annual meeting of the club, a review of its activities during the year was given, and it was felt that much good had been accomplished.

Top row: Mrs. John Gavin of Chicago; Mrs. W. F. Black of Enid, Okla., president of state auxiliary; Mrs. Sam A. Rice of Oklahoma City, Okla. Lower picture: Group of ladies from Syracuse, N. Y. Photos taken at the recent Buffalo convention of the National Association of Master Plumbers

The entire official staff was re-elected for the coming year, thus showing the auxiliary's appreciation of the work of its officers. Members expressed much appreciation for the hospitality extended by Mrs. Litvin, the treasurer, to the club, at her home in Evanston, where the previous meeting was held. An enthusiastic vote of thanks was given Mrs. Litvin, and particular mention was made of the delicious luncheon which was served. The officers expressed their appreciation of the loyal support of the members throughout the year. After business had been disposed of, bridge and five hundred were enjoyed for the rest of the afternoon.

Salt Lake Auxiliary Gives Surprise Party to Master Plumbers

The Ladies Auxiliary to the Salt Lake City, Utah, Association of Sanitary and Heating Engineers, gave a surprise party for the masters on June 20. Just as the regular bi-weekly meeting of the masters was closing, in came the ladies, bringing with them card tables and various games. An hour later a chicken dinner was served by one of the well known catering establishments.

The affair, which was highly enjoyed, was under the general direction of the officers of the auxiliary. These are: Mrs. Robert Snedden, president; Mrs. Parley G. James, vice president; Mrs. Will Rees, secretary-treasurer.

Mrs. Snedden announced that arrangements for holding

Undoubtedly

The Most Popular Automatic Water Heater Priced to Fit Everyone's Pocketbook

15 Gal. $50 30 Gal. $70
20 Gal. $55 40 Gal. $85

Distributed by the Plumbing Trade at a Nice Profit.

Why wouldn't it be the Most Popular?

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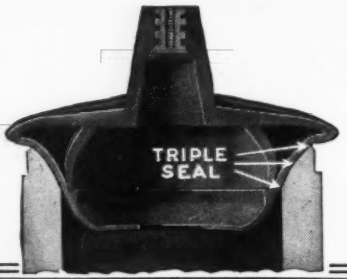

The Float that Stops the Leak

TRIPLE SEAL FLOAT

Here is a new design, a new principle, in tank balls, the Triple Seal Float. Made of purest rubber, it expands as the result of the water pressure in the tank

The remarkable flexibility of the Triple Seal Float positively assures the stopping of any leakage due to scale, slime or sediment forming on the seat

Exhaustive tests, made under all conditions likely to be encountered in service, have failed to turn up a single fault in the Triple Seal Float construction.

Order it from your jobber or write us direct.

Golden State Rubber Mills
1920 E. Vernon Avenue Los Angeles, Calif.

Health-Safety first!

Automatic Stream Control

A distinctive Halsey Taylor feature—water never too high, never too low—practical and efficient — SANITARY!

Write for Catalog

No longer need your customer worry about contamination from drinking water supply—no more unsanitary bubblers, no necessity for lips to touch the source of supply—thanks to Halsey Taylor Drinking Fountains.

Patented features make them health-safe—in fact that's the main reason for their preference.

THE HALSEY W. TAYLOR CO.
Warren, Ohio

No. 605 Wall Type

HALSEY TAYLOR
Drinking Fountains

the essay contest in the Salt Lake City high schools next year have been completed. The contest for the best essay on health and sanitation is expected to be held in February, 1930, with suitable prizes for the winners.

Vice President George M. Whitely, presided at the meeting of the masters in the absence of President Parley G. James, who was a delegate to the national convention. The following committee was chosen to take care of the membership drive: Henry H. Bockholt, past president of the Utah State Association, chairman; George W. Bruerton and Mr. Whitely.

Local Auxiliary Activities

At a recent meeting of the Women's Auxiliary of Lawrence, Kans., an interesting paper was read by Mrs. A. E. Olson on the subject of "Local Auxiliary Activities." Excerpts from this paper follow:

"When we think of the reason why we organized a local auxiliary, we naturally think back to the organization of the very first ladies' auxiliary to the master plumbers' assocation and wonder just what prompted those first few

Top row: Mrs. P. C. Lobach, Mrs. C. H. Kramer, Mrs. E. P. Sneger and Mrs. H. A. Sneger, all of Allentown, Pa. Second row: Mrs. W. J. Scannell, Mrs. H. F. Hare, Mrs. M. W. Scannell and Mrs. J. G. Rogers, all of Kansas City, Mo. Bottom row: Mrs. H. Bunker, Mrs. D. F. Thurman, Mrs. E. Wendland and Mrs. M. P. Geist, all of North Hudson, N. J. Photos taken at the annual convention of the National Association of Master Plumbers

to begin the work which has been so widespread. I think the main thought in the minds of those few women was that an organization of this kind would show the men that they were interested in this work and were willing to back the men in their undertaking. It took faith, because we remember Mrs. Hornbrook said the plan didn't meet with the approval of the men, and that it took a great

deal of urging and pleading to make them see it their way. But they did win out, and we know the scholarship fund which they started, and which is still going, is one of the big things which the women have done, which will mean a great deal in the future to the men. Although locally we cannot undertake so much, the fact that we want the men to know we are interested in their undertakings and that we want to help them all we can, is no doubt the thought which has prompted us to organize. And I believe the men are proud of the fact that we have taken this step. Don't you feel yourself that you can accomplish more and work with greater zeal if you know that you have somebody who is taking a deep interest in your work? And so I feel, with the interest of the women, the men are going to be more interested.

"I can see where our local organization can help the small town plumber and his wife. There are many small places where there are not enough to organize an auxiliary, but we may avail ourselves of the opportunity of interesting these people. This can be done by written invitations, or better still, if we are in a small town and can possibly see these people it would help. In a social way I think the plumber's auxiliary serves an important purpose. I feel that the wives of master plumbers should be acquainted, and an organization of this kind is about the only way this can be accomplished.

"We are organized for the purpose of accomplishing some definite work, with not only the good of the master plumber in mind, but for the good of the community. The idea of Mrs. Shimmons, our president, to improve the sanitation in the schools is a good one, and another is the essay campaign in which all high school children could take part.

"The offering of a prize will interest many, and plumbing will be talked in the homes for many weeks. I know work of this kind seems a big undertaking, but let us remember that our auxiliaries are not founded for what we can get out of them, but what we can put into them. Our success lies in what we can do, and our auxiliary will be just as strong as we care to make it."

Discuss Picnic Plans

On June 19, at 1:00 o'clock, the Ladies Auxiliary of the Denver Master Plumbers' Association, met at the home of Mrs. B. X. Bordeau. Being a little unusual, the spaghetti luncheon which was served proved most delicious. After the regular business meeting, at which time plans were discussed for a basket supper to be held at one of the local parks, the usual Monte Carlo whist game was played. Mesdames J. P. Brickey, E. B. Clayton, C. R. Cooper, Robert Demmer, Will Hensler, R. A. Hurley, Frank Hanlin, V. A. Kiser, Vincent Kandorf, H. H. Mellema, F. H. Samson, S. J. Slattery, Guy Stocking, Carl Thurston, and Frank L. Welle, were in attendance.

Kansas City Auxiliary Holds Meeting

The Women's Auxiliary to the Master Plumbers' Association of Kansas City, Mo., held its regular meeting recently at the home of Mrs. George Foley. Luncheon was served at one o'clock. Those assisting the hostess were: Mesdames Manning, Satterlee, Hample, Joyce and Kuebler. After luncheon, a business meeting took place, conducted by the president, Mrs. Ira Henderson. Mrs. Manning was chosen as delegate to the convention of the national auxilitary in Buffalo, as Mrs. Henderson was unable to go because of her husband's illness. It was voted to give a donation to the National Scholarship Fund. The ways and means committee arranged an afternoon card party which was held at the home of Mrs. J. C. Friel on

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The ORIGINAL Compound Lever Ball Cock. Elevated, Low-Down, Top and Bottom Supply Tank Levers and Valves.

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NELSON RELIEF VALVE

The Nelson is *the real relief valve;* the only one with an external phosphor bronze spring and the only one that is "Built with a click"

Adjustable, on the job, to any desired pressure and when the maximum adjustment is reached, you will hear the Nelson Relief Valve *click.* ASK YOUR JOBBER

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THE STACK HEATER COMPANY
BALL COCKS INDIRECT HEATERS GAS WATER HEATERS HEAT INTERCHANGERS HOT WATER GENERATORS
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RELIEF VALVES NO TANK VALVES NONBIPASS VALVES STEAM WATER MIXERS PRESSURE REDUCING VALVES
TWO HUNDRED AND FIFTY STUART STREET
BOSTON

Air-Tight Steel Tank Co.
PITTSBURGH, PA.

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TANKS FOR: High pressure gas and air storage— Pneumatic water systems—Gasoline and oil storage—Oil burning equipment—Open top—Welded. ATSCO Genuine Copper Brazed tanks for high pressure—the tightest, safest, strongest tank it is possible to construct by any known process. A.S.M.E. code tanks.

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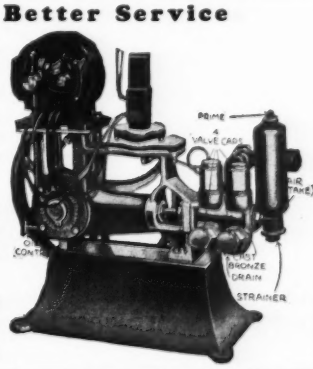
Because of its many fine construction features, any Kalamazoo Water Supply System will give better and longer service at less cost.

Fewer parts, protected by a bath of oil make the Kalamazoo your best bet.



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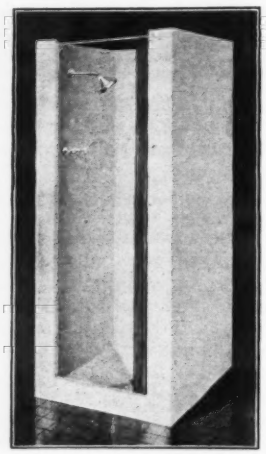

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Let us show you how to get your share of the generous profits being made from this "extra bath" business. Write today for full details and actual facts. No obligation, of course. . . . HENRY WEIS MFG. CO., INC., Elkhart, Indiana, Licensed Manufacturers.

WEISTEEL

SHOWER STALLS-COMPARTMENTS-CUBICLES

June 21. It was largely attended, and everyone felt that it was a most successful affair.

North Shore Auxiliary Gives Party

The Women's Auxiliary to the North Shore Sanitary Engineers' Association (Illinois) held its last meeting for the season on Friday evening, June 21. After business had been transacted, cards were enjoyed, Mrs. MacArthur, Mrs. Woods and Mrs. McKenna carrying away the honors. On Saturday evening, June 22, a surprise party was given for Mr. and Mrs. Alfred J. Chester, who planned to sail, July 6, for a trip abroad. The surprise was complete, and after the Chesters had recovered their composure, card tables were arranged and all enjoyed the games until midnight, when refreshments were served. The president of the auxiliary, Miss Esther Schmeisser, presented the travelers with a beautiful steamer rug, and all expressed their good wishes for a happy and profitable voyage.

Hold Last Summer Meeting

The last summer meeting of the Newton, Mass., auxiliary was held at the home of Mrs. C. D. Kieser of Newton Centre, on Wednesday evening, June 12. One of the members, Mrs. M. Hickey, who celebrated her tenth wedding anniversary, was presented with a beautiful dinner ring at a little surprise party which followed the regular business meeting. Refreshments were served, and a pleasant evening was enjoyed.

New Business Ventures

Portland, Ore.—C. J. Kelly Co. is a new plumbing and heating firm incorporated July 1 by Charles J. Kelly, Alex Booth and E. M. Pearson. Articles were filed by A. G. Wright, Gerlinger building, Portland. Mr. Kelly, head of this new company, is one of the leading plumbers in Portland. He is a past president of the Oregon State Master Plumbers association and a past national director. He has also been an ardent worker in the Portland Master Plumbers' Association activities.

Princeton, Ky.—J. H. Eaker and W. O. Quirey have opened a new plumbing store in the basement of the new Elks building. Mark Cunningham is manager.

El Paso, Tex.—Texas Plumbing Co. has been incorporated by C. E. McCue, E. C. Smith and N. E. Nations.

South Bend, Ind.—River Park Plumbing and Heating Co., 2921 Mishawaka avenue, has just been launched by Harry Nicodemus and Joseph B. Gross.

New York, N. Y.—The Cameo Plumbing and Heating Corp. has been incorporated, with a capital of $10,000, to operate a plumbing and heating contracting business in Queens county. The concern is represented by H. E. Hoberman, 26 Court street, Brooklyn.

Madison, Wis.—The R. T. Royston Plumbing and Heating Co. has been incorporated to carry on a general plumbing and heating business. The firm is incorporated with 500 shares at $100 each. Incorporators are R. Royston and A. Kelly.

San Francisco, Calif.—J. Irving and Co. have engaged in the plumbing, heating and ventilating business at 160 Seventh street.

Bridgeport, Conn.—S. Vall has opened a plumbing and heating business with offices at 17 Garfield avenue. Mr. Vall was formerly in business in New York City.

Aitkin, Minn.—J. E. Butterfield of Maple Plaine has

engaged in the plumbing, heating and sheet metal business.

New York, N. Y.—The Harstone Plumbing Co. has been incorporated in the Bronx, to operate a plumbing business. The new concern is represented by A. L. Gould, 11 Park Place.

Tillamook, Ore.—George I. Burckard has engaged in the plumbing and heating business at 300 West Third street.

Portland, Ore.—The Rose City Plumbing and Heating Co. has been incorporated by J. A. Ostrum, W. E. Mellor, G. M. Mellor and Bert Newman.

Detroit, Mich.—The Acme Plumbing and Heating Co., 2248 Gratiot avenue, has been incorporated to conduct a plumbing and heating business.

Louisville, Ky.—The DeRuntz Heating and Plumbing Co., capital $20,000, has been incorporated by L. E. DeRuntz, William M. Rupp and Peter Eschmann.

Raymond, Wash.—W. T. Stapleton has engaged in the plumbing and heating business under the name of Willapa Harbor Sheet Metal and Plumbing Co.

Business Changes

Akron, Ohio.—Bricker and Schwalbach Plumbing Co. have moved from 51 West Bowery street to 18 South Summit street.

Tallulah, La.—The firm known as Harrop and Son of Dumas, Ark., has moved its entire establishment to this city, and will be known hereafter as the Tallulah Plumbing and Sheet Metal Co., Post Office address Box 99.

Peoria, Ill.—The firm of Crowley Bros. has recently been incorporated, and continues as a retail firm.

Choteau, Mont.—J. E. Byrne, formerly of White Sulphur Springs, has purchased the A. D. Huffman plumbing business in this city.

Brookfield, Ill.—Frank Garner has moved his plumbing business to the Graham and Schultze building on Prairie avenue.

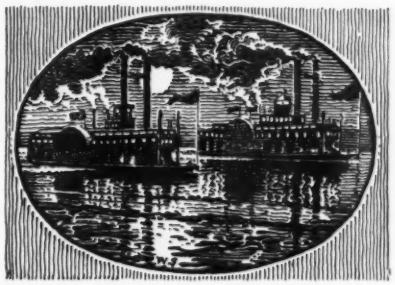
Durham, N. C.—W. H. Rowe has sold his interest in the Carolina Heating and Engineering Co. to the Messner Heating Co.

Chicago, Ill.—John Blair has moved his plumbing contracting headquarters from 3919 North Kimball avenue to 2044 Devon avenue.

Dunnellon, Fla.—T. L. Kelly has reopened a plumbing business and is located on the corner of Dougal avenue near the A. C. L. depot.

Chicago, Ill.—George J. Bongerz is the successor to

The plumbing and heating shop of Quinn Plumbing Co., Miami, Fla. J. A. Quinn is president of the company

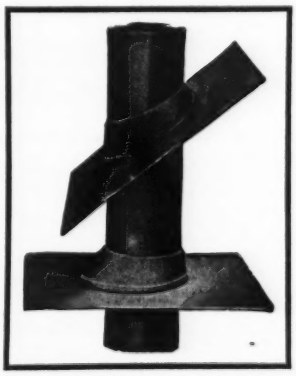


"STEAMBOAT BILL" AND BELKNAP VALVES

ON June 30, 1870, the famous race between the R. E. Lee and the Natchez from New Orleans to St. Louis was won by the former in 3 days and 18 hours.

History does not record whether the Lee in bettering the time of her rival by 7 hours, (due to the Natchez machinery having to be repaired) was equipped with Belknap valves but an 1870 catalogue of Belknap and Burnham, later The Belknap Manufacturing Company of Bridgeport, Conn., shows they were manufacturing "Mississippi gauge cocks" of brass in addition to a rather complete line of globe, angle and check valves.

BELKNAP



OATEY ROOF FLASHINGS

Several features distinguish the Oatey 4 in 1 Roof Flashing from the ordinary type. The pure lead collar which gives least resistance to proper caulking is one of them.

Fits any size pipe without cutting or trimming. From your jobber.

L. R. OATEY CO.
5500 Walworth Ave.
Cleveland, O.

K-W SELF CLEANING WASTE

Guaranteed Not to Stop Up

POSITIVE WATER TIGHT DOUBLE SEAT

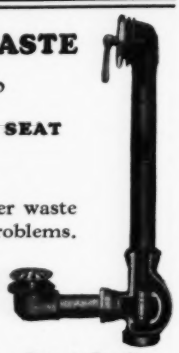
Economical to Install

A trouble proof, positive action trip lever waste that will solve your concealed waste problems.

"ANOTHER K-W PRODUCT"

Kuhnle-Winslow Co.

Grand Haven (The Brass City) Mich.



Patents Pending

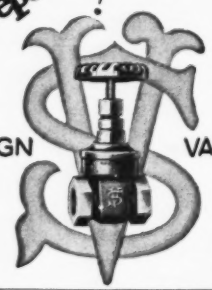
Absolute Dependability since 1886

SCOTT

A COMPLETE LINE OF BRONZE AND IRON-BODY

VALVES

-built for long life

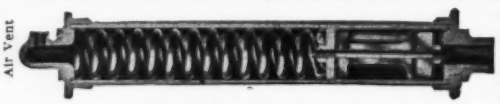


SIGN VALUE

SCOTT VALVE MFG. CO. DETROIT MICH.

"MAXIMUM SERVICE PER DOLLAR"

Air Vent



Water Supply

Stop Water Hammer With

The STINSON Patent Equalizing Valve

A system designed to prevent Water Hammer and any reaction in the water supply system in the building. If properly installed, the Stinson Equalizing Valve is guaranteed to completely and thoroughly remove any vibration in water pressure systems of piping.

The Valve is made in sizes as conditions require.
Stock sizes: 1¼, 1¾ and 2¼ inch.
1¼ inch will take care of from ½ inch to 1¼ inch supply.
1¾ inch will take care of from ½ inch up to 2 inch supply.
2¼ inch will take care of from 2 inch up to 4 inch supply.

Send rough sketch of piping in basement and I will advise you the proper place to install the equalizer.

Robert Stinson, 1632 Forbes Street, Pittsburgh, Pa.

MOST HEAT per DOLLAR

Every week more and more plumbing contractors are clinching the house heating business in their communities by taking on the sale of Roberts Controlled Gas Heating Units. Quickly and easily installed in any hot water, steam or warm air furnace.

Write us today for sales proposition

ROBERTS-GORDON Appliance Corporation
Curtiss Bldg.,
Delaware Ave. at Tupper St
Buffalo, N. Y.

Otto T. Brachvogel, in the plumbing and heating business located at 6921 North Clark street.

Lansing, Mich.—Gross Brothers, 321 North Washington avenue, have incorporated their plumbing, heating and refrigeration business under the style of Gross Brothers, Inc., with a capital stock of $25,000, of which $16,000 was turned in, in property.

Moscow, Ida.—H. D. Powell has succeeded to the plumbing and heating business of the old firm of Powell & Delong.

Martinsville, Va.—Stultz Brothers, Inc., has let the contract for erection of two-story, 33x87 ft., business building on Franklin street, to cost $12,000.

Brooklyn, N. Y.—In order to provide funds for a program of expansion, the Jankowitz Plumbing and Heating Corp. has increased its capital stock from $3,000 to $20,000.

Oil City, Pa.—The Conway Tin and Plumbing Shop, owned and operated by L. A. Conway, has moved into new quarters at Central avenue and Front street. The firm is now located in a modern two-story building.

Lawrenceville, Ill.—The Lawrenceville Plumbing and Heating Co. has sold its stock and equipment to the Indian Refining Co., but will temporarily maintain its office until all accounts are settled.

Tulsa, Okla.—The Watt Plumbing Co., 608 South Cincinnati street, of which O. G. Watt is manager, has plans ready for construction of a one-story, 140x300 feet warehouse and distributing plant, to cost about $60,000.

New Trade Literature

Circular About Tank Heater

Smock Water Heater Co. of Indianapolis, Ind., is distributing a circular describing its tank heater. A diagram shows a double cleaning tank heater unit, where one heater boils two tanks of separate solutions. The heater, the circular states, burns coal, coke, gas or fuel oil.

Folder of Bryan Steam Corp.

Bryan Steam Corp., of Peru, Ind., is sending out a circular describing its copper tube boilers. An illustration in colors shows the boiler.

Booklet of Holby Burner Corp.

Holby Burner Corp., of New York City, is distributing a booklet describing its oil burners. A number of illustrations show various types of buildings in which these oil burners have been installed. A fan and pump unit, and an automatic burner suitable for apartments and commercial buildings, are also illustrated.

"Useful Information and Miscellaneous Tables"

A bulletin entitled, "Useful Information and Miscellaneous Tables," has just been compiled by Chicago Pump Co., Chicago. The tables have to do with pumps and hydraulics, and there is much information on the subject of centrifugal pumps. Data for determining capacities of bilge pumps, determining capacities of sewage ejectors, gravity tank house pumps and pneumatic water systems, diagrams showing suction lifts, tables of friction of water in pipes, etc., are included.

Bulletin of Wickes Boiler Co.

Wickes Boiler Co., of Saginaw, Mich., has just issued "Bulletin 29-A" describing its heating boilers. Information on the subject of design, construction, workmanship and performance is given, and several diagrams are in-

cluded. There is also a section devoted to specifications.

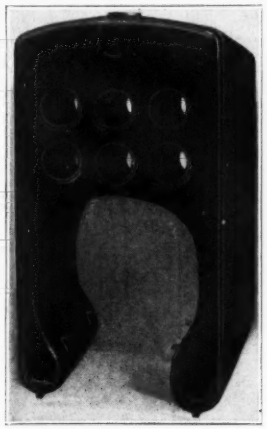
Catalog of Goulds Pumps, Inc.

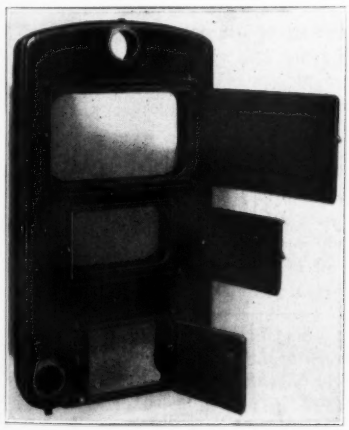
Goulds Pumps, Inc., of Seneca Falls, N. Y., has just issued its "Catalog S and Handbook," listing piston and plunger, diaphragm, rotary, centrifugal, hand-force and deep-well pumps; condensation outfits, sump pumps, pressure washers, etc. Technical descriptions and illustrations are given. In the back of the catalog are thirty-two pages of data including installation diagrams, illustrative examples, etc., for the assistance of the dealer.

New Equipment

Announcement Is Made of a Steel Sectional Boiler

A new boiler made of steel, and of the sectional type, has been announced in the field of low pressure heating. Attention is called to the fact that this boiler is made up of rolled steel plates. These plates are 5/16-inch in thickness, and shapes are formed or flanged by hydraulic hot-press methods. In the case of the front and rear sections, they are made by the shaping of two plates or heads which are butted together and electrically arc-welded. Heads of intermediate sections are made in a similar manner. These heads are then welded to outside, and inside, or fire box, bands which provide depth to the section. A steel bar is welded to the bottom of the legs upon which the boiler rests and which tends to prevent air leaks under the boiler.



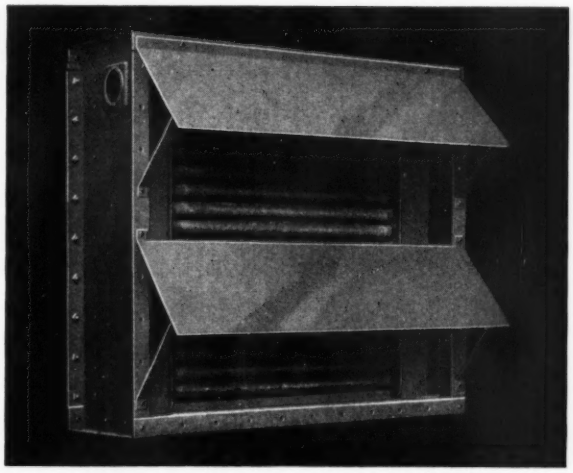


Intermediate sections are made in depths of 16 inches and 24 inches. Boilers are assembled in three to five sections, that is, front and back and one to three intermediate sections. Each connection is made with four machine bolts, two ring plates, and a copper cased asbestos gasket. Grates are assembled and connected without bolts or cotter keys or the use of special tools. The steel heat insulating casing consists of six pieces that are assembled without bolts.

The boiler is designed to respond to the burning of either hard, soft or lignite coal, coke, oil or gas. Chief advantages accruing from this steel construction are lightness of weight.

These boilers are put out with guaranteed ratings and in sizes ranging from 650 to 7000 (twin boilers) steam rating.

The Terre Haute Boiler Works Co. of Terre Haute, Ind., is the manufacturer.



On Your Next Heating Job— Try Clarage

WHEN you select Clarage Unit Heaters for factory or garage installation, you take no gamble.

First, because Clarage Unit Heaters are sold exclusively to heating contractors by direct Clarage representatives. This means that on every job you can have the help of a competent fan heating engineer.

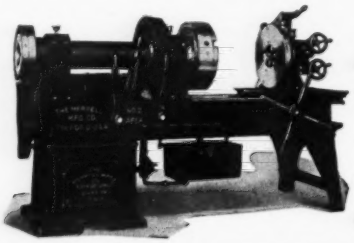
Second, because Clarage engineers draw upon a complete line of equipment in making recommendations—a line of both ceiling and floor type unit heaters broad enough to meet any requirement—small or large—no matter how special. This means results produced—guarantees made good.

From the contractor's standpoint, Clarage Unit Heaters are very profitable equipment to install. The expert assistance afforded by Clarage engineers, and the scope and quality of the product, assure satisfied customers—no loss of time and profit through costly "come-backs." On your next heating job—try Clarage! Write us for complete information.

CLARAGE FAN COMPANY
KALAMAZOO, MICHIGAN
Sales Engineering Offices in 25 Cities

CLARAGE
Unit Heaters

new and better—
Threads 1 to 4-inch pipe with only one change of dies



The newly perfected Universal Die Head of the Merrell No. 2 Apex Pipe Machine provides maximum flexibility as to pipe sizes, using only two sets of dies, and yet retains the sturdy rigidity and accuracy that has made Apex Machines so popular. No change of die head or loosening of face plate—it is quick, accurate and dependable, truly universal. Ask for details before you select your machine.

(Also No. 3 Apex for 1 to 6 in. pipe.)

MERRELL
PIPE THREADING (for BETTER threads) MACHINES
836 Curtis St. - Toledo, O.

NATIONAL DISTRIBUTING COMPANY
115 Prince St. PLUMBING SPECIALTIES BRASS GOODS NEW YORK

Did you get our VERY LATEST 56 Page Catalogue?

NATIONAL DISTRIBUTING CO.
115 Prince St., New York

Pipelines
Connected by L Y T

MODERNIZED

Traveler: "Porter, I want to be called at 5 o'clock in the morning."

Porter: "Boss, Ah guess you-all isn't 'quainted with these heah modern invenshuns. See diss heah button, heah? Well, when you-all wants to be called, you jest presses dat button an' we comes an' calls you.

—SALES TALKS.

SUMMER PRAYER

Now I sit me down to work,
I hope to goodness I won't shirk;
If I should snooze before I'm through,
I hope the boss is snoozing, too.

—L.N.O'F., Los Angeles.

ORIGINAL SIGNERS

"You have a fine signature, Mr. Brown," said a salesman to a buyer who had just signed an order with many flourishes.

"Yes," said the buyer, loftily, "I should have. One of my forefathers signed the Declaration of Independence."

"Zasso?" said the salesman. "You ain't got nothing on me. One of mine signed the Ten Commandments."

—T.N.O'F., Los Angeles.

MIGHTY LAK' A ROSE

L'll Pickanniny,
Looks just like his poppy;
Don' know what to call him,
'Less it's Carbon Copy.

—TYPING TIPS.

MORE SCOTCH

"You may laugh at the Scotchman, but there are two good things in his favor. He is very polite and he enjoys a good joke.

"Well, courtesy costs nothing, and humor is a gift."

—TITBITS.

A LIMERICK OR TWO

There was a young lady named Ruth,
Who had a great passion for truth;
She said she would die
Before she could lie,
And she died in the prime of her youth.

There was a young lady named Stella,
Fell in love with a bow-legged fella;
This risky young chap
Let her sit in his lap,
And she fell right through to the cella.

There was a young lady of Ryde,
Of eating green apples she died;
Within the lamented
They quickly fermented,
And made cider inside her inside.

—T. F., Boston.

MERCHANDISING

A high pressure salesman was showing an Iowa prospect a strip of arid Texas land.

"This is the garden spot of the country," he said; "or it will be when a little development is done. Why, the truth is, all it needs now is a few good people and plenty of rain."

"I suppose so," was the farmer's answer. "That's all hell needs, too."

—KABLEGRAM.

Many a man, in order to buy a precious stone for the girl of his choice, takes a chance on brimstone for himself.

—L Y T.

Bath a Day Movement

Among recent uses of the "Story of the Bath," putting the N. O. Nelson Mfg. Co.'s branch at Salt Lake City in line with the many plumbing and heating contractors and wholesalers who have used the booklet, was the distribution of copies to visitors at the first public showing of some new model display bathrooms.

Wm. R. Fenn, of New Britain, Conn., writes that the Kiwanis club of his city will have a "Plumbers' Day" in September. He and Thomas Firth are arranging a program which is to include the Bath a Day idea.

The problem in such programs is, of course, to make them remain in the memories of those who attend. The best method is to have something which will keep the message fresh. That something, for the plumbing contractor, may very well be "The Story of the Bath," an interesting little booklet. The method which a number of men, both in the contracting and wholesaling branches, have followed is to distribute copies of the booklet as souvenirs.

If you have never read "The Story of the Bath," write us for a free copy.

Epigrams—For Your Use

He is a lucky man who doesn't believe in luck.

* * *

The rainbow chaser at least gets a run for his money.

* * *

As a tonic for a rundown reputation try a dose of charity.

* * *

A man's wife frequently has more faith in him than he has in himself.

* * *

Envy is the lowest known form of praise.

* * *

As long as a woman can change her mind she doesn't seem to mind.

* * *

The man who is worthy of his hire cannot be blamed for looking higher.

* * *

Self-satisfied people have nothing more to live for.

* * *

Love's young dream often bumps up against a rude awakening.

* * *

Many a good reputation has been stabbed by a pointed tongue.

* * *

It's a poor artist who isn't able to draw his own conclusions.

* * *

Misery loves company. That's why some bachelors and spinsters marry.

◆

Alex Murray Receives Honorarium

Alex W. Murray, plumbing inspector at Twin Falls, Idaho, has received a $100 gift from the National Association of Master Plumbers. Mr. Murray was informed that his name and that of George F. Uber of Philadelphia, were read at the national convention as the only surviving charter members of the association, which was formed forty-seven years ago. He is both a charter and honorary member and celebrated his 81st birthday July 25 of this year. He has been plumbing inspector for a number of years at Twin Falls.

IDEAL DRAINAGE PUMPS and BASEMENT DRAINERS

$65.00 F. O. B. DETROIT

Capacity 3000 to 3500 Gallons Per Hour

Further Particulars Furnished Upon Request

IDEAL PUMP COMPANY
1202-04 W. Fort St., DETROIT, MICH.

How Busy Are You When You're Working?

You haven't time to bother and fuss about setting up a vise stand and pipe bender, have you? And you certainly can't run back and forth to the shop with a job, can you?

You don't have to, if you have a Martin Portable Vise Stand and Pipe Bender.

Ask your jobber or

H. P. MARTIN & SONS
626 E. 2nd St. Owensboro, Ky.

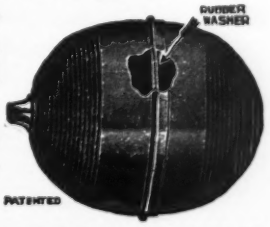
SEMLER FITTINGS

The reason so many drainage jobs are forgotten is because they are equipped with SEMLER Fittings. With Semler Fittings on the job there is no occasion to remember them.

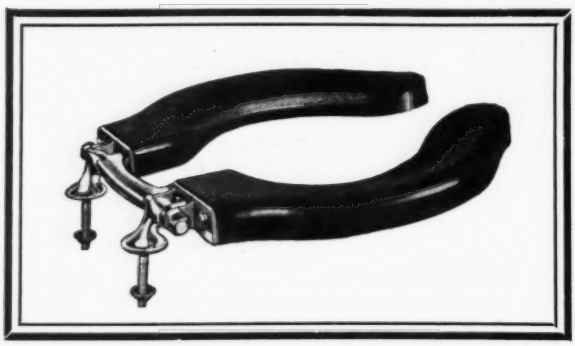
Ask your jobber to supply you

Semler Company
Jeannette Pennsylvania

No-Sol Floats are made of heavy gauge sheet copper and are put together in two sections with a rubber washer, seamed securely in. No-Sol Floats work perfectly on all makes of valves. Your jobber can supply you.



THE AYLING & REICHERT COMPANY
3047 N. Erie Street :: Toledo, Ohio



EVERNU

The IDEAL INSTALLATION

where hard usage is to be expected and long-term economy is important.

The patented EVERNU process by which these handsome hard rubber seats are formed can't be duplicated. It gives them unsurpassed ability to keep their good looks through long years of severest service—no scarring, chipping or cracking that smooth, glossy surface; no warping—no loosening of hinges. The hollow center gives unusual lightness and unequalled strength.

Every EVERNU Seat is unconditionally guaranteed not to split, break, crack or craze.

Send for an actual cross section and a catalog. They are free.

Sold exclusively through jobbers of plumbing supplies

NEVER-SPLIT SEAT CO.

Founded 1905

Dept. 27, Evansville, Ind., U. S. A.

LARGEST MANUFACTURERS OF TOILET SEATS IN THE WORLD

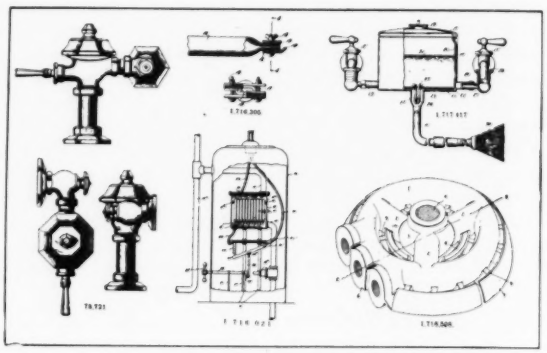
PATENTS

Plumbing Department

78,721. Toilet Flush Valve. Charles Eckert Young, Chicago, Ill., assignor to Imperial Brass Manufacturing Co., Chicago, Ill., a Corporation of Illinois.

1,716,021. Water Heater. Otto von Zsolnay, Charles Coquelin, and William Schulz, Brooklyn, N. Y.

1,716,305. Lawn Sprinkler. George Dillman, Raton, N. Mex.



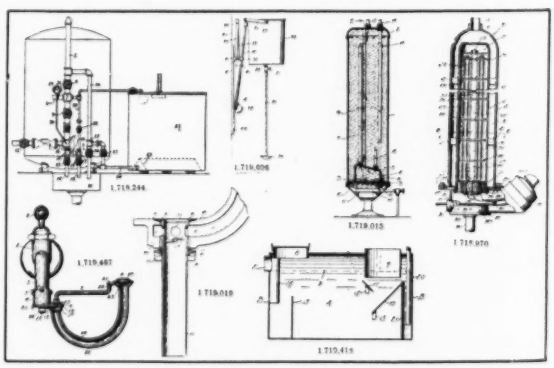
1,717,417. Dishwasher. Raymond B. Shoemaker and Charles L. Lawrence, New York, N. Y.

1,716,508. Water Heater. Grant Smith, Toronto, Ontario, Canada.

1,718,244. Water-Softening Filter. Harry Markham Marsh and Robert Stirling, Hamilton, Ontario, Canada, assignors to W. J. Westaway Company Limited, Hamilton, Ontario, Canada.

1,719,696. Shower Bathing Apparatus. Robert J. Gillespie, St. Martinsville, La., assignor of one-fourth to Henry Randazzo, one-fourth to Avery Landry, and one-fourth to Bert Jacobson, St. Martinsville, La.

1,719,015. Water Heater. Charles U. Levis, Philadelphia, Pa.



1,718,970. Electric Heater for Hot-Water Systems. Simon J. Lonergan, La Porte, Ind., assignor to Bastian-Morley Company, La Porte, Ind., a corporation of Indiana.

1,719,487. Sanitary Drinking Fount. Louis C. Rathbun, Oelwein, Iowa.

1,719,019. Waste Pipe for Lavatories and Sinks and Method of Manufacturing the Same. Robert H. Mueller, Decatur, Ill., assignor to Adolph Mueller, trustee, Decatur, Ill.

1,719,418. Septic Toilet Tank. Thomas Bennett and Ambrose D. Sloane, Perry, and John W. Fortenbaugh,

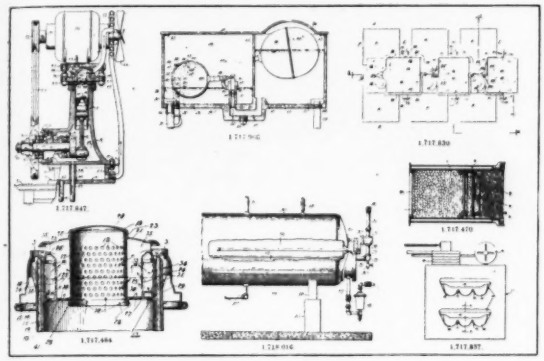
Buffalo, N. Y., assignors to Kaustine Company, Inc., Perry, N. Y.

Heating Department

1,717,470. Air Filter. Robert Speidel, Calmbach, near Wildbad, Germany.

1,717,484. Liquid-Fuel Burner. Lewis T. Wilcox, Peekskill, N. Y., assignor to Wilcox Patents Corporation, Peekskill, N. Y., a Corporation of New York.

1,718,016. Temperature Controller. John C. White and Roy W. Miller, Madison, Wis.



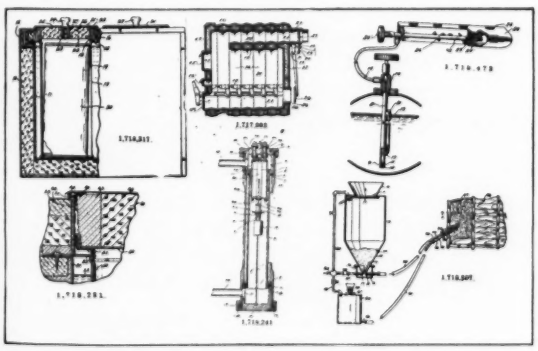
1,717,830. Pulverized-Fuel-Burning Apparatus. John E. Bell, Brooklyn, N. Y., assignor to Combustion Engineering Corporation, a Corporation of New York.

1,717,847. Pump for Refrigerating Apparatus. Thomas J. Little, Jr., Detroit, Mich., assignor to Copeland Products, Inc., Detroit, Mich., a Corporation of Michigan.

1,717,857. Mechanical Refrigeration. Charles C. Spreen, Detroit, Mich., assignor to Kelvinator Corporation, Detroit, Mich., a Corporation of Michigan.

1,717,966. Water-Feed Control for Liquid-Fuel Burners. Raymond L. Foster, Apponaug, R. I.

1,717,993. Means for Controlling the Rate of Combustion in Heating Apparatus. Andre M. Mertzanoff, New York, N. Y., assignor to American Radiator Company, New York, N. Y., a Corporation of New Jersey.



1,718,317. Refrigerating Apparatus. William F. Swezey, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware.

1,718,473. Oil-Burning Device. John E. McCutchen, Wichita, Kans., assignor to The Coleman Lamp and Stove Company, Wichita, Kans.

1,718,281. Refrigerating Apparatus. John Ralph Fehr, Dayton, Ohio, assignor to Frigidaire Corporation, Dayton, Ohio, a Corporation of Delaware.

1,718,815. Method and Apparatus for Cooling Air. Walter L. Fleisher, New York, N. Y., assignor, by mesne

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Buffalo Breezo-Fin Unit Heaters, made in six sizes and two types provide you with a complete, efficient, quiet, inexpensive heating system regardless how large or small an area you want heated.

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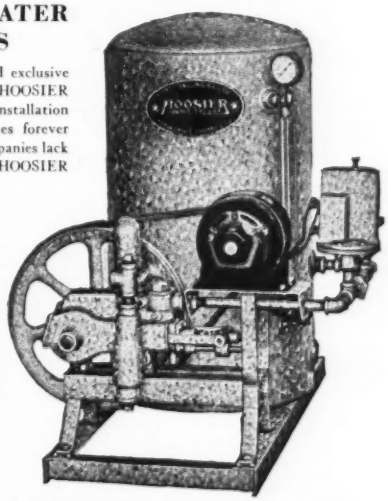
MANY new, improved exclusive features make the HOOSIER the ideal water service. Installation of a HOOSIER abolishes forever the drudgery that accompanies lack of water under pressure. HOOSIER systems furnish water from any source of power—electricity, gasoline, wind—and draw water with equal satisfaction from wells, springs, or lakes. The HOOSIER is very economical to operate. The famous GalVAZink rust-resisting coating, inside and out, makes for many years of carefree, uninterrupted service. Write for details without obligation.



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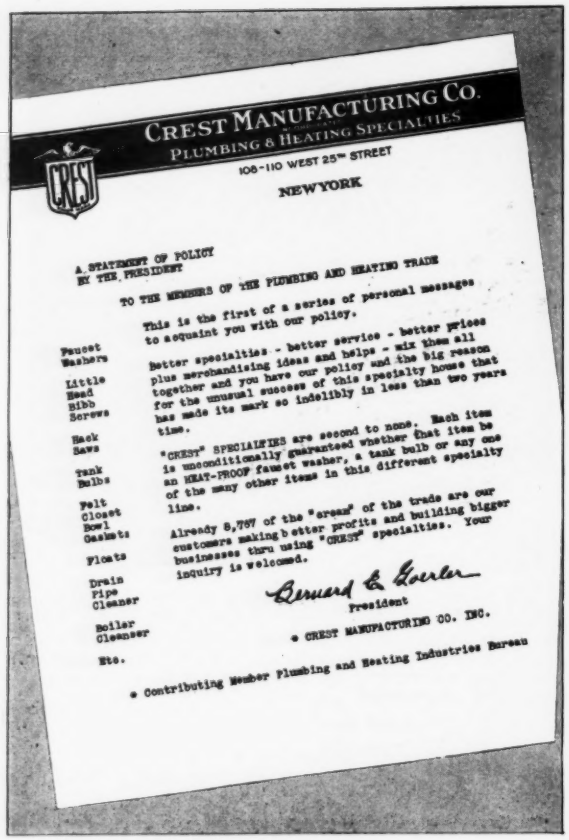
CREST MANUFACTURING CO.
PLUMBING & HEATING SPECIALTIES
108-110 WEST 25TH STREET
NEW YORK

A STATEMENT OF POLICY
BY THE PRESIDENT

TO THE MEMBERS OF THE PLUMBING AND HEATING TRADE

This is the first of a series of personal messages to acquaint you with our policy.

Better specialties - better service - better prices plus merchandising ideas and helps - mix these all together and you have our policy and the big reason for the unusual success of this specialty house that has made its mark so indelibly in less than two years time.

"CREST" SPECIALTIES are second to none. Each item is unconditionally guaranteed whether that item be an HEAT-PROOF faucet washer, a tank bulb or any one of the many other items in this different specialty line.

Already 8,767 of the "cream" of the trade are our customers making better profits and building bigger businesses thru using "CREST" specialties. Your inquiry is welcomed.

Faucet Washers
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President

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5" Round

FOR high tank work, the 5-inch Reichert Float shown here is unsurpassed. It has weight and buoyancy to open and close any make of valve used in high tanks.

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The Breakers
ON THE OCEAN FRONT
Atlantic City, N. J.

PREFERRED

In all seasons by those who know and wish the best either upon the American or European plan.

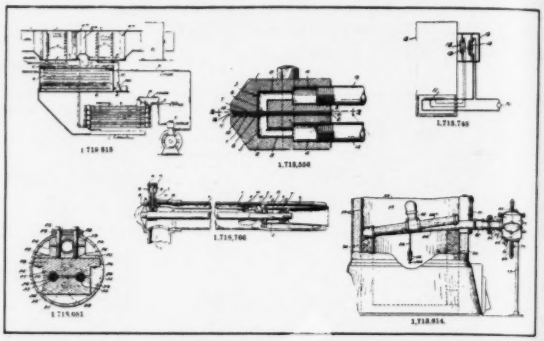
Sensible rates
HILLMAN MANAGEMENT
BATHING FROM ROOMS

assignments, to Auditorium Ventilating Corporation, Jersey City, N. J., a Corporation of New Jersey.

1,718,241. Automatic Controller for Boiler Water Supply. Hans F. Laas, St. Paul, Minn.

1,718,507. Heat Insulation of Walls. Edwin H. Wenzel and Maximillian P. Janisch, Milwaukee, Wis.; said Janisch assignor to said Wenzel.

1,718,556. Oil Burner. Cecil H. Harrison, Enid, Okla.



1,718,748. Temperature Regulation. Laurence K. Marshall, West Somerville, Mass., assignor to Spencer Thermostat Co., Cambridge, Mass., a Corporation of Massachusetts.

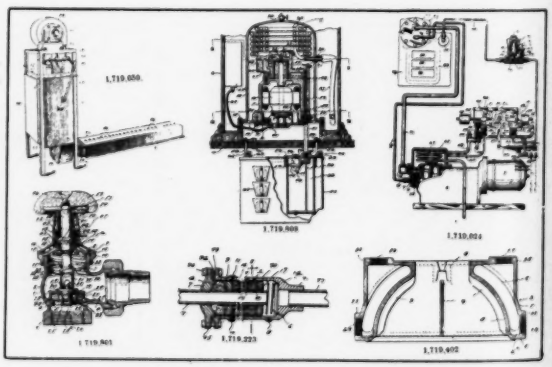
1,718,681. Mounting for Oil Burners. William McK. Braybrooks, Philadelphia, Pa., assignor to Gulf Oil Burner Company, Pittsburgh, Pa., a Corporation of Pennsylvania.

1,718,766. Lubricating System for Oil Burners. Ralph S. Thoresen, Boston, Mass., assignor to Petroleum Heat and Power Company, New York, N. Y., a Corporation of Delaware.

1,718,614. Apparatus for Burning Liquid Fuel. William J. Turner, Seekonk, Mass.

1,719,659. Heating and Ventilating Apparatus. Alfred Hopkins, Boston, Mass., assignor to Hopkins-Tull Machinery Co., Philadelphia, Pa., a corporation of Pa.

1,719,808. Refrigerator. Andrew A. Kucher, Chester, Pa., assignor to Westinghouse Electric & Manufacturing Company, a corporation of Pennsylvania.



1,719,024. Refrigerator. John R. Replogle, Detroit, Mich., assignor, by mesne assignments, to Kelvinator Corporation, Detroit, Mich., a corporation of Michigan.

1,719,801. Valve. George Bethune Duffield, Detroit, Mich., assignor to Detroit Lubricator Company, Detroit, Mich., a corporation of Michigan.

1,719,223. Pipe Coupling for Steam and Air Pipes. Matt Grohek, Superior, Wis.

1,719,402. Hot-Water Boiler. William B. Reed, Westfield, Mass., assignor to H. B. Smith Company, Westfield, Mass., a corporation of Massachusetts.

1929

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PAGE(S) MISSING

Pages 167-172 are index for preceding volume.

THE HANDY SPEEDLOK

Domestic Engineering Catalog Binder

Especially designed for the standardized catalog page adopted by the plumbing and heating industries

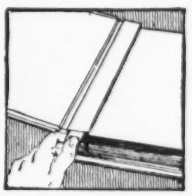
The SPEEDLOK is a quick operating catalog binder designed to fit reprints of catalog pages in "Domestic Engineering Catalog" as well as all other catalog pages that conform to the standards adopted by the plumbing and heating industries.

Easy and speedy operation are special features of this binder. A slight pull on the concealed bar under the top cover unlocks mechanism when sheets are inserted. Equipped with bar for removing sheets when changes are made.

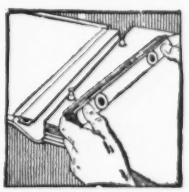
Minimum capacity 1¼ inches. By simply unscrewing extension posts capacity can be extended to 2¼ inches. Works perfectly for all requirements—either a few sheets or filled to capacity.

Covers are bound in heavy black Levant Grained Fabricoid, semi-flexible, very durable and attractive looking.

Price of binder—$3.00 each. ***Prices on quantities on application.***

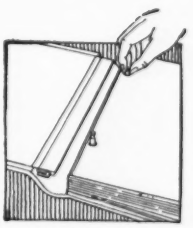


To unlock Binder—Pull out slide bar in top wing. Top cover will immediately fall back.



To lock Binder—bring top wing back over the posts—be sure posts fit in the holes in the top wing—then push in slide bar.

Separate the sheets where desired and slip sheets off the posts. Take out sheets or put in new ones as desired. These three moves take but a few seconds. Each operation is a natural one.



To increase or to decrease the capacity of the binder is a simple operation. The two posts are so constructed that they can be easily raised or lowered to meet the height requirements. Binder posts can be extended from 1¼ inches to 2¼ inches.

For Jobbers' Salesmen—

The loose-leaf system reduces to the minimum the bulk and weight of catalog material required by the salesman. Only matter actually required for selling purposes need be carried in the binder. It does away with the necessity of carrying entire catalogs, booklets and circulars of various sizes and shapes.

Salesmen using the loose-leaf system have a great advantage over men not using this equipment—to say nothing of the added convenience, time and labor-saving features.

With a modernly equipped loose-leaf binder, the salesman can present his products in a more comprehensive manner than it is possible to accomplish by the old methods. Having all his material up to date in compact form and easily available, he can show latest specifications, answer questions or quote prices more readily.

For Plumbing and Heating Contractors—

Many master plumbers and steamfitters assemble working catalogs from standardized catalog sheets filed in binders.

Domestic Engineering is in position to furnish without charge, upon request, loose sheets—which are reprints from catalog pages appearing in "Domestic Engineering Catalog"—of several hundred manufacturers. They are standard catalog page size—10⅝x8½ inches—are printed on a good grade of light paper and punched according to the standard adopted by the plumbing and heating industries. These sheets fit the SPEEDLOK binder.

When orders for binders are accompanied by requests for catalog reprints the binders will be equipped with the sheets desired and shipped complete.

Write for full details regarding loose sheets and binders.

Domestic Engineering Company

1900 Prairie Avenue ***(Catalog Dept.)*** **Chicago, Illinois**

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WANTED LIVE SALESMEN CALLING directly on plumbing contractors. We will extend fullest cooperation in advertising and sales promotion work. Exclusive territories. State experience and give references. General Manager, Geneva Heater Company, Geneva, Illinois.

EXECUTIVE TO TAKE FULL charge of office of large plumbing and heating contractor in Washington, D. C. Must be thoroughly experienced in buying plumbing and heating materials. Write full details, giving date when you can come to Washington for personal interview. Fruend Plumbing and Heating Co., care Harry Friedman, C. P. A., Earle Building, Washington, D. C.

SALES REPRESENTATIVES WANTED for the Gorton Single Pipe Vapor Heating System, in territories now open. State experience and other lines handled. Communications held confidential. Gorton Heating Corporation (Manufacturers), Established 1887, 96 Liberty Street, New York.

W A N T E D — MANUFACTURERS' agents for Detroit to handle Vapor specialties. Liberal commission and territorial contract. This line is easy to sell as it has special practical features and is inexpensive. This is an opportunity for the right man. Address Key 376, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

REPRESENTATIVES WANTED IN leading cities to handle highest grade line of radiator shields and radiator cabinets. Our representatives earn $500.00 to $1,000.00 per month the year around, above expenses. Full selling plan furnished. Address Key 256, "Domestic Engineering," 1900 Prairie Ave., Chicago.

SALESMEN BY MANUFACTURER OF extensive line of plumbers' brass goods, selling direct to trade. Address Key 371, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

YOUNG MAN WANTED FOR COMPILing catalogs by large manufacturer and jobber located in central states. One thoroughly experienced in plumbing and heating supplies, also having knowledge of catalog work preferred. Address Key 379, "Domestic Engineering," 1900 Prairie Ave., Chicago.

EXPERIENCED RADIATOR AND Boiler Salesmen wanted for Cleveland district. Excellent opportunity to become Branch Manager. State experience, age, and previous employers in replying. Federal Radiator Company, Zanesville, Ohio.

EXPERIENCED SALESMAN TO SELL a line of plumbers high grade brass goods to the jobbing trade. Address Key 370, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

YOUNG MAN FAMILIAR WITH JOBbers in Philadelphia, Pittsburgh, Baltimore and Washington to handle standard line of Tubular Plumbing goods in connection with only one other account. Address Key 373, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

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WONDERFUL MONEY-MAKING SIDEline or exclusive proposition for salesman calling regularly and direct on plumbing dealers. Communications strictly confidential. KOIL-LES HEATER COMPANY, Geneva, Illinois.

Lines Wanted

MAN, LOCATED IN CENTRAL NEW York, with twenty years' experience in the sale of Plumbing and Heating equipment, desires complete lines of plumbing and heating materials to sell trade and jobbers. Wide acquaintance among contractors and jobbers from Buffalo to Utica. Will carry accounts if necessary. What have you to offer? Address Key 377, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

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FOR SALE—PLUMBING AND HEATing Business in Good Central Iowa town of 23,000 population. Doing a very nice business. Good reason for selling. Equipment in good shape. Can reduce stock and equipment to suit purchaser. Address Key 367, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

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Manufacturer's Agent with 15 years' successful sales experience, 8 years in California representing such firms as Josam Manufacturing Co., Eljer Co., Kennedy Valve Co. and Never-Split Seat Co., which accounts were relinquished last September to accept present position as Sales Manager, will resume operations as manufacturer's agent September 1st; desires major accounts for California or Southern California territory. Excellent standing among jobbers, plumbers, architects.

Address:
G. J. REARDON, 539 Citizens National Bank Building, Los Angeles, California.

Man (32) thoroughly experienced and dependable as bookkeeper, estimator and buyer for plumbing and heating contractor's office, desires to make change. Location no object. Address Key 378, "Domestic Engineering," 1900 Prairie Avenue, Chicago.

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MERCHANDISING THE PLUMBING BUSINESS. By Karl W. Zoeller. A treatise on merchandising as applied to the plumbing and heating business, that should be read by every plumber, contractor or jobbing plumber. The subject is completely covered by the twenty-six chapters, and in a manner making it interesting and easy to read. It contains many valuable suggestions on Window Display, Showrooms, Ad-

How is the horsepower of a tubular boiler determined? What is a vacuum? What is evaporation? What is buoyancy of a liquid? What is condensation? What is fluid friction? How are joints to be tested for leaks? What is a riser?

These questions and scores of others are given with clear, concise answers in "Questions and Answers on the Practice and Theory of Steam and Hot Water Heating." Carefully classified to aid quick finding, these questions and answers will be put to every day use by the heating man.

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